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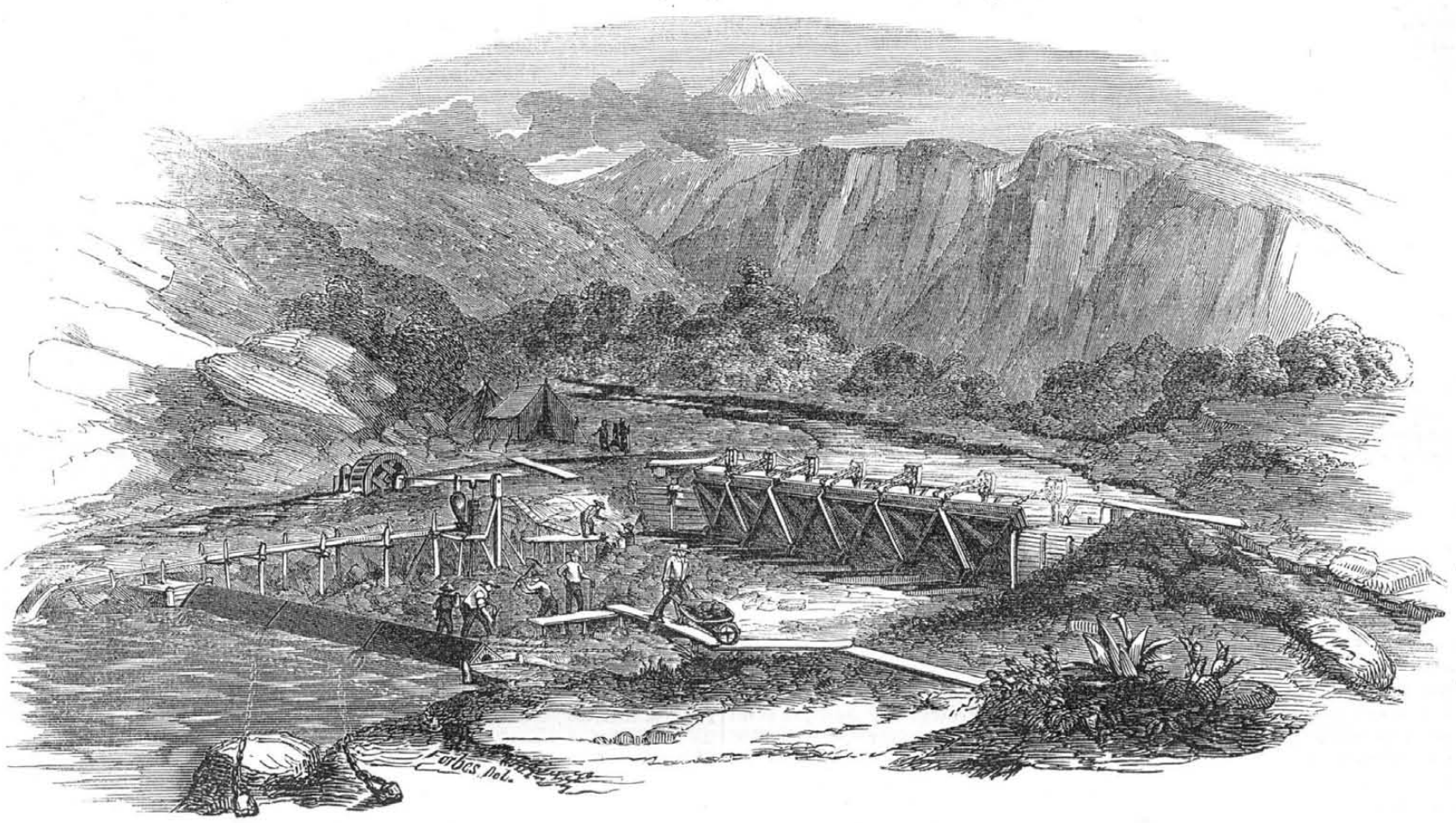
PORTABLE DAM FOR CALIFORNIA.---Figure 1.

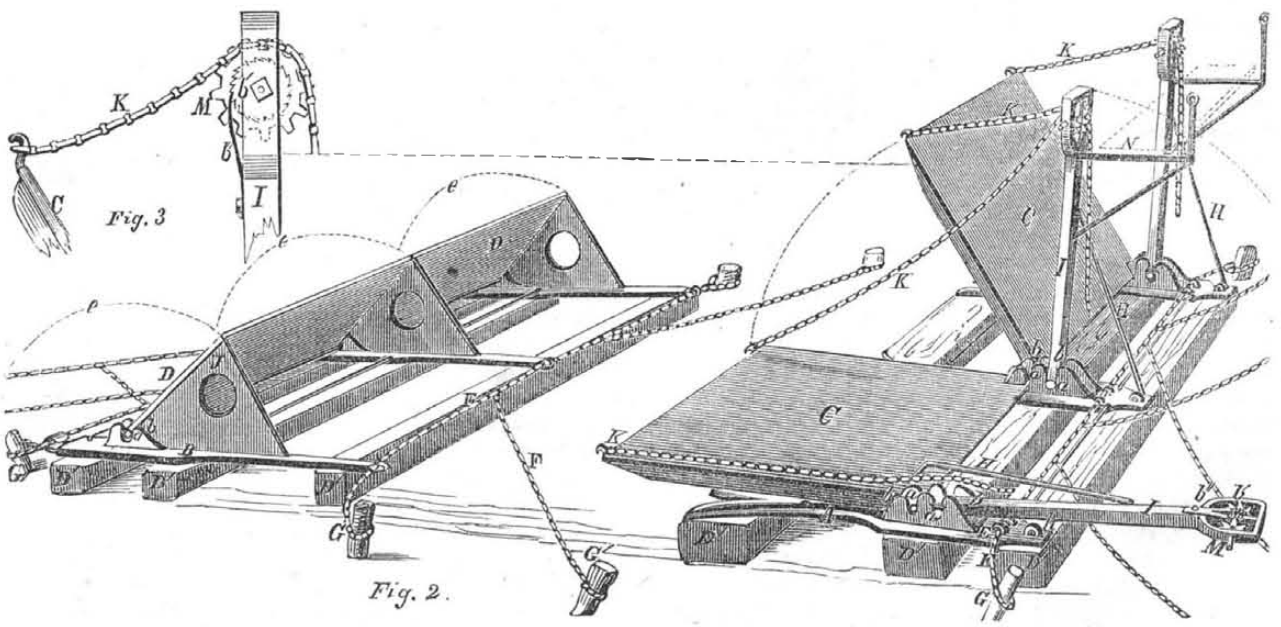


The annexed engravings are views of a New Sectional Portable Dam, for the golden sanded rivers of California. The inventor is R. V. De Guinon, of Williamsburgh, N. Y., who has taken measures to secure a patent. J. P. Kenyon, of the same place, is the assignee of one half the interest of the invention. Figure 1 is a view of the dam as applied in California, and the men at work in the dry bed of the stream protected by the dam. Figure 2 is a perspective view of the dam and all its parts, and fig. 3 is a small vertical section of the windlass for operating the sections of the dam. The same letters refer to like parts.

This dam is designed for the gold regions, for laying bare the beds of streams, and diverting and directing their courses. It is so constructed that when the wet season comes on, all its vertical parts and gates can be laid horizontally with the bed of the river, so as to allow the water to pass over freely without injuring it. Or when a transient freshet occurs, one or more sections of this dam may be lowered so as to allow the increased volume of water in the stream to pass by.

As applied in figure 1, the dam is shown in its two parts, the head or upper breakwater part, and the lower or backwater part. The water is shown as being directed from its course to the one side by a short canal, which drives a water wheel that operates a pump for drawing up and discharging the water that may be enclosed, or that oozes through between the upper and lower parts of the dam. Miners are shown at work in the bed of the stream which has been laid bare, and the auriferous earths are being wheeled on planks to the banks to be washed in the canal or in the stream behind the back of the dam. In figure 2, G G are stakes driven into the banks of the stream; D′ D′ D′, are heavy sleepers; A is a strong sill, fastened to the sleepers of the upper part of the dam, and B is a like sill or cross bearer on the lower part; F F are chains for securing the dam to the stakes; H is a strong cross bolster beam, on which the posts, I I, of the windlasses are secured. These have pivot foot rests, *a*, below, and are capable of being lowered flat, as shown by the one at the nigh side. These windlasses are for lifting and lowering the gates, C C, of the dam—the gates, forming parts of the same. The chains, K K, connect the windlasses with the gates—these latter having also pivot joints or axes, *a*, resting in the bearing boxes, *b*, of the sills, A B. The crank handles N, are for winding up the chains on the drum, M, of the windlass, on which is a pawl and a ratchet wheel, *b′ b″*, which operate in the usual manner. The dam being made in sections can be operated and managed with a few hands and with great ease. The section, figure 3, shows how the windlass lifts up the gate, C, and keeps it in the position required, as shown in figure 1, thus forming a vertical lock gate. On the lower or backwater half of the dam, there are triangular bridges, J J, on which the gates, D D, rest. These gates have hinged bottoms and are raised into their places to lie on the bridges, J J, as represented by the dotted lines, *e e e*. These also are raised and lowered by chains. As these gates rest on axles in proper foot bearings, they are raised and lowered with comparative ease. Having thus described these parts, their mode of operation and uses will be easily understood. One section of the head or breakwater part of the dam is shown laid horizontally as would be done during a temporary freshet, or how they would be laid down during a long regular freshet. It is only required to keep the water from coming in at the head and foot, the stream being directed from its course by the short canal.

This dam, it will be seen, is composed of two distinct parts, and it can be set across the whole breadth of a stream, or only half across. In the latter case, the upper and lower parts of the dam would be connected or walled in with a third section like one of the other two, to form the side, or indeed the whole four sides may be made of like sections, and thus form a portable coffer dam. Nothing more is required to be said in explanation of this dam. Figure 1 shows its application and objects so clearly and well that all can understand it, excepting its application as a coffer dam. It will be understood that all the parts are to be made strong in proportion to the volume of water.



Every improvement in portable dams is of great importance, not only to our own people, but to the whole world—Australia, &c.—as well as California.

More information may be obtained by letter addressed to Mr. De Guinon or to Mr. Kenyon, Williamsburgh, N. Y.

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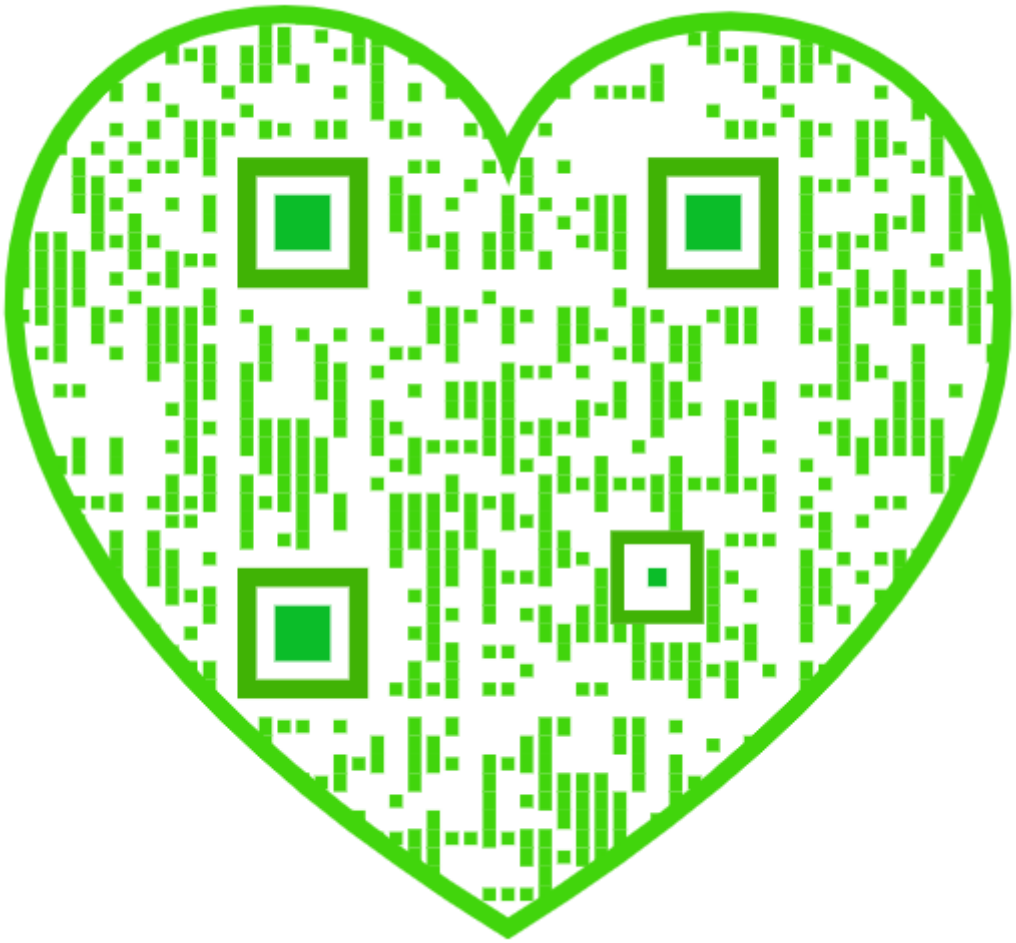

Flax Industry.—No. 6.

The flax production is the principal source of agricultural wealth to Holland. It is cultivated most extensively in South Holland, Frise, Zealand, "Brabant-on-the-North," and in some parts of North Holland, Utrecht, Auvergssel, and Dreuthe. Holland has always exported the principal part of its flax in an unmanufactured state, it is estimated that only one-twentieth of the quantity produced is consumed in the country. Coarse goods and burlaps are produced in small quantities in the Houses of Correction, and in Alms Houses. The only manufactories of fine thread are in Boxtel and Amelo, and these are of comparatively little importance. In spite of all the efforts of the Dutch, their manufactured goods have always been inferior to those of Belgium, with the exception of the Holland duck, which has always maintained the highest reputation.

In South Holland, and in some parts of North Holland and Brabant, they cultivate a blue-flowered flax, which sells for from 26 to 60 sous per stone of three kilogrammes. In the districts of Brielle, Zealand, and Dutch Flanders, they cultivate a white-flowered flax which sells for from 28 to 45 sous per stone of three kilogrammes. The district of Frise furnished a yellow-flowered flax, which resembles very closely a very fine variety of hemp, and for which they obtained from 20 to 42 sous per stone of three kilogrammes. The culture of flax greatly increased in Holland after the introduction of flax-spinning machinery. In 1836 the amount of flax exported, of all varieties, was upwards of 17,000,000 lbs.

In 1841 it was estimated that the yearly production of flax was double that produced in 1836, five years previous. The quality was about the same, however, as before. A recent Dutch writer in speaking of this, says:—"We do not hesitate to express our opinion, that the relative inferiority of Dutch flax is to be ascribed entirely to the immense quantity produced. As an illustration it may be stated that one farmer in the vicinity of Rotterdam, in the year 1850, sowed upwards of four hundred acres with flax. It will readily be seen that it becomes extremely difficult, with so large a crop, to give to the plants that care and attention which they demands.

The great market for Dutch Flax is in Rotterdam, and the exportation is almost exclusively to England, Scotland, and Ireland.

Dutch flax of the average quality is capable of producing by machine spinning a thread of the fineness of No. 80 English enumeration.

Andrew Yarranton, Gent., of England, in a letter published in 1677, thus quaintly describes the method of spinning flax pursued in Holland and Germany at that period. He says:—"In all towns there are schools for little girls from six years old, and upwards, to teach them to spin, and so bring their tender fingers by degrees to spin very fine, which being young, are easily fitted for that use, whereas people overgrown with age cannot so readily feel the thread. Their wheels all go by the foot, made to go with much ease, whereby the action or motion is very easy and delightful. And in all towns there are schools according to the bigness or multitude of the poor children. I will here show the way, rule, method, and order by which they are governed.

First, there is a large room, and in the middle thereof a little box like a pulpit. Secondly, there are benches built round the room, as there are in our play houses; upon the benches sit about two hundred children spinning, and in the box in the middle of the room sits the grand mistress, with a long white wand in her hand. If she observes any of them idle she reaches them a tap; but if that will not do she rings a bell, which by a little cord is fixed to the box, and out comes a woman; she then points to the offender, and she is then taken away into another room and chastised. And all this is done without one word of speaking. And I believe this way of ordering the young women is one great cause that German women have so little *tuit-tuat*. And I am sure it would be well were it so in England. And it is clear that the less there is of speaking, the more there may be of working. In a little room by the school there is a woman that is preparing and putting flax on the distaffs, and upon the ringing of the bell and pointing the rod at the maid that hath spun off her flax, she hath another distaff given her, and her spool of thread taken from her and put into a box with others of the same size to make cloth.

And observe what advantages they make of suiting their threads to make cloth, all being of equal threads. First, they raise their children as they spin finer, to the higher benches. Secondly, they sort and size all the threads, so that they can apply them to make equal cloths. Whereas, here in England, one woman, or good housewife, hath, it may be six or eight spinners belonging to her, and at some odd time she spins, and also her children and servants, and all this thread shall go together, some for woof, some for warp, to make a piece of cloth. And as the linen is manufactured in England at this day, it cannot be otherwise. And is it not a pity and shame that the young children and maids here in England should be idle within doors, begging abroad, tearing the hedges, or robbing orchards, and worse—when these, and these alone, are the people that may, and must if ever, set up this trade of making fine linen thread here? And after a young maid hath been three years in the spinning school, that is taken in at six and continues until nine years, she will get eight pence the day. And in these parts I speak of, a man that has most children lives best, whereas here, he that hath most is poorest. There the children enrich the father, here they beggar him."

(For the Scientific American.)

Rays and Visibility of Stars.

The *tails* or *rays* which appear to radiate from the stars and planets, when contemplated with the naked eye, and which are always used in pictorial representations of these shining orbs, are, according to Hassenfratz, caustics on the crystalline lens. That they arise only from a defect, if this we may call it, of the organs of vision, any one may easily satisfy himself by observing their change of position just as the head is inclined in one and the other direction. Probably these tails, which give a beautiful radiant appearance to the nocturnal sky, greatly impair the vision of minute stars that are situated in the vicinity of brilliant ones. The general invisibility of Jupiter's satellites may be attributed in part to this cause; for some of them are certainly bright enough to be seen by the naked eye, were they removed from the neighborhood of the planet. *Alcor*, a star of the fifth magnitude, situated within 11′ 48″ of *Mizar*, in the tail of *Ursa Major*, but overpowered by the rays of the latter star, was employed by the ancients as a test of the powers of vision. I can hardly see the propriety in their using this star for that purpose, for it must be visible to the majority of observers. I can always distinguish this star when others of the same magnitude in the constellation are visible. I generally perceive six tails or rays about such stars as *Sirius*, *Vega*, and the planets *Jupiter* and *Venus*, four belew and two above them, having lengths not exeeeding 5′ or 6′. Around the less brilliant stars of the first magnitude, I notice five rays; and about those of the second magnitude only four are seen, making right angles. I perceive no tails about any stars of less than the third magnitude, and rarely about any of this magnitude.

Different observers make the number of the visible stars in the *Pleiades* from six to ten, or more. The usual number seen is seven; I constantly perceive nine stars in this cluster, and sometimes ten or eleven—the ninth one being below the seventh magnitude. The two stars marked *a* (*Alpha*), *Capricorni*, being five or six minutes apart, can be readily perceived as separate. The stars *e* and 5, *Lyrae*, which are both of the fourth magnitude, and separated by only a distance of 3½′, are usually set down as a single star in appearance to the naked eye, and marked *e* (*Epsilon*) on the star maps. I can almost invariably recognise these stars as distinctly separate, without telescopic aid, even on bright moonlight nights and in strong crepusculum or twilight. Each of these closely situated stars is a double star, presenting the combination of a double-double, or quadruple star; but a telescope of considerable power is required for thus perceiving them. I do not remember of ever having noticed these stars to appear single.

Minute objects of the sky can often be much better seen aside from the axis of vision, by looking steadily at some star a little removed from the object which we wish to perceive, and to which the *attention* is all the while directed. A little practice will enable any one to perceive objects in this manner, which would otherwise be indistinctly seen or even invisible. By thus looking at *V* (*Nir*) *Andromedæ*, the great nebula near it may be seen oftener on light moonlight evenings. STILLMAN MASTERMAN.

Weld, Me., April 28, 1854.

(For the Scientific American.)

Stuffing and Preserving Birds.

I have seen in the "Scientific American," lately, a number of inquiries as the best method of stuffing and preserving birds; I noticed also that in one of your replies "to correspondents," you say that arsenic is the best material; in another you state that there is no reliable work upon that subject. The first statement is an error: arsenic is not the best material, although it may be that most generally employed. The best is the solution of corrosive sublimate. Arsenic in the form most commonly used, arsenical soap, is very dangerous to the operator; and there are few who have long used arsenic in any form for this purpose, who have not experienced its deleterious effects upon the constitution. The solution of corrosive sublimate can be applied entirely by means of a brush, so that the operator need never come into personal contact with it. Even if he should do so by any accident, the worst result to be dreaded is but a slight salivation; and this is hardly to be feared unless he should swallow some part of the solution or bring it in contact with an open wound.

Of works on this subject, the best are, without doubt, those of Waterton. I am acquainted with no others equally scientific and practical. In an appendix to the "Wanderings," he gives the most complete detailed account of the best method of proceeding, from the first beginning to take off the skin to the final placing the bird upon its permanent perch. There is now in this country a specimen prepared by Mr. Waterton, some fifteen or twenty years ago, which is at this day not only complete and perfect to the minutest feather, but as elastic and flexible as when alive. The same solution is applied externally upon the feathers, which prevents their ever being attacked by moth or any other vermin.

In some of Waterton's miscellaneous writings there is a full account of the same method as applied to preserving the skins and fur of quadrupeds. V.

New York, May 16, 1854.

Submarine Telegraphs.

MESSRS. EDITORS—Permit me, through the medium of your excellent paper, to make a few remarks upon a subject to which a notice in a paper drew my attention. The notice to which I allude was of a Magnetic Telegraph across the Atlantic. Many do not consider the obstacles to such an undertaking (even those immediately concerned.) In the first place it is necessary that the wires should be covered with a non-conducting, compact, and elastic substance, which I think would be difficult to find; now glass is the most solid of known non-conducting substances, yet I have seen a bottle hermetically sealed and then sunk to a great depth in the ocean, and upon withdrawing it, it was found filled with water, which leads us to suppose that glass, although generally believed to be solid, is infinitely porous. I would propose an experiment which might save much treasure, and also the humiliation of a failure. Let two pieces of wire, suitably covered, be prepared, and sunk in two parts, doubled, connected in the middle with an electro magnet, and the extremities with the poles of a battery. If magnetic action was not developed in the magnet, it would simply prove that the water, owing to its immense pressure, had penetrated the covering and established a current between the two extremes of the wire, thus showing that an ocean telegraph is impracticable.

I make the above statement with probably the same feelings that caused the person to ask Sir Isaac Newton why it was necessary to cut two holes in his door that his cat and kitten might enter his study. TAL. FULANO.

Hudson, N. Y., May 8, 1854.

[Is our correspondent positive that the *bottle* he saw sunk was *hermetically* sealed? Was it not merely corked and sealed over with wax? On page 269, Vol. 4. "Scientific American," there is a letter from Dr. Nelson, on board the ship "Tarolinta," bound for California, in which it is stated that a corked and sealed bottle was let down 60 fathoms, and came up half full of salt water; but a tube that was hermetically sealed with the blow-pipe, and let down 89 fathoms, where it remained fifteen minutes, came up without a drop of water in it. This proved that the water in the bottle did not pass through the glass. Glass is not fit for a marine cable, and will not be used. Telegraph wires laid on the bottom of the German Ocean are now in successful operation, and this is proof already for the success of the Ocean Telegraph. The trouble will be in working, without relays, such a long line as that between our continent and Europe.

Building Locomotives in New York.

MESSRS. EDITORS—For a long time past it has seemed very strange to the writer that there were no works for making locomotives in the City of New York—that we in the central and northern part of New York State should be obliged to go to distant cities for locomotives. The facilities of your city for dispatching locomotives for the new and old railroads in this State and the Western States, I think are superior to any other part of the country. Nothing contributes more to the prosperity,—the material prosperity—of a city, than well-conducted manufactories. Somewhere in the upper part of New York City, on the North River side, would be a good place to establish this branch of business. New York is unrivalled in steamship building: let her become so in the manufacture of locomotives.

ENTERPRIZE.

Rome, N. Y., May 6, 1854.

(For the Scientific American.)

To Prevent Incrustations in Steam Boilers.

There has been considerable said, from time to time, in the columns of the "Scientific American," about preventing and removing Incrustation on Iron Steam Boilers, and to this time, I have seen nothing so economical, certain and simple, as the remedy in use at this place, where hard or limestone water is used and no incrustation whatever, nor has there been any, since it was put in operation. The remedy is simply to boil the water before using it in your boiler, and to use half a bushel of wheat bran whenever you empty or blow out your boiler, which should be done at least once per week, or oftener, if the incrustation is very thick, and a huge quantity of lime held in solution by the water. The water is boiled in some kind of a vessel by the escape or exhaust steam.

The re-acting pressure on the piston will only be about two and a half pounds to the square inch, when the water in the vessel does not exceed five feet. The pipe to convey the water to the boiler should be inserted, say 8 or 10 inches above the bottom of the vessel, in order to prevent the precipitated lime from passing to the boiler. The boiling water should be led into an open receiver near the force pump, in order to allow the steam to escape, otherwise the pump will work in the steam and be prevented from forcing water into the boiler. The lime will unite or aspire to the bran, and more or less scour the inner surface of the boiler, and thereby soon remove the incrustation.

S. D. J.

Mount Pleasant, Pa., May 2nd, 1854.

Fruit on the Chaldean Plains.

Layard says that these plains produce some of the finest fruit in the world. A very delicious peach has lately been introduced into England, which has created a good deal of excitement among nurserymen. The plains in the spring of the year are covered with gorgeous flowers. Truffles grow there in great abundance, and are quite extensively used as an article of food.

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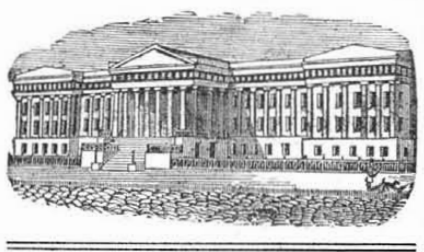

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MAY 16, 1854.

CLAPBOARD JOINT—Wm. Baker, of Utica, N. Y.: I claim the combination of the tack in the rear of the joint, with the extended lip, in front, constructed and used in conjunction, for the purpose of effecting the objects of the invention, as specified, the whole being arranged as set forth.

HARVESTER RAKES—Cyrus Roberts, of Bellville, Ill.: I claim the fingers, arranged as described, and operated by means of a rod, eccentric, rod, and lever, in combination with the fork, as shown, viz, with a curved slot through it, in which the pin or arm fits, and operated by the crank, for the purpose of removing the cut grain from the platform, as described.

[See notice of this invention on page 84, Vol. 9 Sci. Am.]

LATH MACHINE—Hiram Frisbee, of Olmstead, Ohio: I claim the combination of the movable cam blocks, stay lever, ratchet dog, and weight, for the purpose of successively turning and griping the log in the following manner: the ratchet dog rotates the log the thickness of a lath as the stay lever passes over the movable cam block, in the instant the stay lever passes the movable cam block the stay lever is reversed by the action of the weight, causing the log to be griped and held stationary by the point of the lever, during the process of sawing.

The act of turning and griping the log takes place alternately as the carriage traverses backward and forward in the direction shown.

I claim the combination of the adjustable rollers, the slides, and the adjusting screws, as described.

ROTARY SHINGLE MACHINES—Wm. Stoddard, of Lowell, Mass.: I claim, first, the riving knives, the springs, to which they are attached or secured, and the dressing knives, the bevelled flanched wheel, when they are arranged and operating as described.

Second, I claim the arm placed at or near the center of the wheel, or its mechanical equivalent, when made and used for the purposes of sustaining the shingles while the knives are dressing them.

Third, I claim the levers, in combination with the two springs, G G, for supporting the four springs, F, near the periphery of the wheel during the dressing of the shingles, as set forth.

SELF HEATING SMOOTHING IRONS—C. A. Read, of Waterloo, N. Y.: I claim, first, making the holes which supply the air to the lamps, above the holes, through which the lamp tubes are inserted, so that the air, as it enters to supply the lamps, will deflect the flame down towards or against the bottom, to heat it more rapidly and effectually than it would otherwise do, and heat the top less, as described.

Second, making the inside of the top descend gradually from rear to front, to aid in deflecting the flame down towards or against the bottom so as to heat it more effectually.

TABLES FOR SHIPS' CABINS—W. L. Bass, of Cambridgeport, Mass.; I claim a table for ships' cabins, &c, which is formed in sectional pieces by the backs of two opposite rows of adjacent chairs, the said backs being sustained and operated as described, and also susceptible of being re-converted into the backs of chairs, as set forth.

SURGICAL SPLINTS—S. A. Skinner, of Brownington, Vt.: I claim the combination and arrangement of the long bar, made to extend above the hips, and to have a counter extension strap applied to its upper part, the thigh and leg rests, and the extension screw applied to the bar, as specified. And in combination with the long bar and the counter extension strip of the groin, I claim the projecting screw arm and its body rest, the same being for the purpose of obtaining extension in direct line of the leg as stated

I do not claim the application to a simple foot rest and a bar, to extend up the leg, of a device for producing lateral movement of the foot rest, but what I claim is —combining the connected thigh and leg rests with the bar, by means of two slide rods and slides, and their set screw, as specified, whereby the whole, the combined thigh and leg rests, may be readily and properly adjusted to any leg, whatever may be the degree of projection of the hip thereof.

KNITTING MACHINES—I. M. Hopkins, of Pascoag, R. I.: I claim, first, attaching the locking bars to the same plate or head with the presser bar, in such a manner as to allow them a limited movement, irrespective of the plate or head, under the influence of springs, applied as described, whereby the said bars are enabled to lock the jacks some time before the termination of the descent of the presser bars, to close the barbs, and hence before the commencement of the retreat of the needles; but the necessary continuation of motion of the plate or head to bring down the presser bar is not prevented.

Second, the combination of the springs and the plate attached to the traverser and the tongues attached to the needle bar: the several parts operating as described, to arrest or retard the thread or produce a back drag, as may be required, to tighten the selvage at the commencement of each row of loops.

[This is a very ingenious improvement.]

MOLDING CLAY PIPE COUPLINGS—Joseph Putnam, of Salem, Mass.: I claim the manner of making the mold, viz, in combination of the two conic frustra, and their separation cylinder, or cylinders together, and with the concave cylindrical block, and end boards, as specified, the two parts of the core being supported on a spindle that rests on a concave block, and concentric with its curved surface, as specified.

I do not claim the mere use of cloth or an inelastic fabric to prevent adhesion of the clay to the molding surface, but I claim the employment of stocking net, or an equivalent elastic material, for the cover or covers on the two parts or frustra of the cone, the elastic properties of such cover or covers enabling them to fit closely to the curved surface of the cone without the formation of injurious seams or indentations on the inside surface of the coupling, and besides this the elasticity of the cover or covers, facilitates the removal of the seam from the molded article.

I also claim the wire former, made as specified, viz., of a curved wire or blade, the tension stay and cutter or wire, and the forked stock or handle, the whole being used, as specified.

WATER INDICATORS FOR STEAM BOILERS—T. J. Sloan, of New York City: I claim connecting the float inside the boiler or other vessel, with the indicator or other mechanism outside, by means of a flexible sleeve or sleeves or its equivalent, as specified.

MACHINERY FOR COMBING WOOL—Chas. G. Sargent, of Lowell, Mass.: I claim, first, giving to the feeding apparatus the lapping motion, as specified, by the crank and rockers, or their equivalents, for lapping the fibers of wool on to the teeth of the main comb, as specified.

I also claim, in combination with the feed rollers operated as specified, the employment of the lifting rod for lifting the fibers preparatory to lapping them on to the teeth of the main comb and then separating them, as specified.

I also claim, in combination with the continuous chain of main comb teeth on which the fibers of wool are lapped, a working comb, which is operated by a peculiar motion like that given to the lapping rollers, by having the said working comb attached to and carried by a frame, operated at one end by a crank, or the equivalent thereof and jointed to the vibrating rods or rockers, as specified.

I also claim in combination with the main comb teeth, and with the lapping feed rollers and the working comb, as specified, the employment of a brush or brushes, as described, for holding the fibers of wool after they have been lapped on to the main comb teeth, to prevent them from being drawn out before they are combed, as described.

I also claim, in combination with the endless chain of comb teeth, constituting the main comb, the vibrating finger operating as described, to direct the fibers of wool after they have been combed, to the rollers which draw them off and deliver them to the condensing apparatus, as described.

I also claim giving to the feed rollers an intermittent rotary motion, as specified, that the required quantity of wool may be fed forward for each lapping motion, and then stop during the pulling or separating, as specified.

And, finally, I claim giving to the rollers of the condensing apparatus, which strip the fibers of wool from the teeth of the main comb, a slow vibratory motion in the direction of their axes, as specified.

BATHS FOR COATING METALS WITH OTHER METALS—George Rogers of Enfield, England: I claim constructing the bath in such manner that the upper portion of the molten metal at which the article to be coated enters, is separated by a partition from that portion of the upper part of the molten metal at which the coated article emerges, whereby the flux at the two ends of the bath may be kept separate, and the metal at one end of the bath kept at a much higher heat than at the other, as specified, whereby also pulverulent matter, not a good conductor of heat, may, with important advantages, be employed to cover a portion of the surface of the molten metal, the remainder being covered by flux, as set forth.

KNITTING MACHINES—Henry Burt, (assignor to the Newark Patent Hosiery Co.), of Newark, N. J: I claim, first, the improved method of constructing the pattern cylinder, that is to say, by dividing the same into two parts, so as to be capable of sliding to or from each other on the supporting shaft, whereby variation in the width of the web may be effected, but having the same pattern.

Secondly, I claim combining the pattern cylinder directly with the shifting bar, carriages and yarn guide, as described; whereby I am enabled to economize space and produce a better action in the machine.

Third, I claim the improved construction of the carriage and stop motions, by the addition of a second carriage on which the stop levers and yarn guide are fixed —and these I claim in combination with the shifting bar, as set forth.

Fourth, I claim attaching the point of the yarn guide by a hinge, and so shaping it that it may be pressed down between the needles to form the selvage, as described.

Fifth, I claim the hook bar and its hooks, in combination with the needles and sinkers, as set forth.

WATER WHEELS—Abel Greenleaf, of Kingston, Pa.: I claim, first, the combination of the gate with the scroll, as described.

Second, the recess and the apertures leading thereto, in combination with the leather or its equivalent, as described.

Third, the spiral or wedge-like form given to the portions of the wheel, in combination with the buckets thereof, as described.

Fourth, the tapering form given to the floats, in combination with the double cone-like shape given to the portion of the hub to which they are attached, as described.

Fifth, the change of curvature in the buckets at or near their ends, as shown, arranged so that these ends shall not be overlapped by the ends of the adjoining buckets, as described.

MACHINE FOR PEGGING BOOTS AND SHOES.—Leander Lackey, of Sutton, Mass.: I claim the several parts of the described machine combined, for the purpose of making boots and shoes.

First, I claim the hanging jack or last holder, by universal joint, so arranged as to press against points of the inclined spur wheel, and held firmly at the proper time by clamp or analogous device.

Second, I claim the receiver when this is so combined with a concave guide, in which it revolves to receive the peg directly as it is cut from the block, and convey it directly to the hole pierced by the awl.

Third, in combination with the revolving receiver, I claim the awl and punch when they operate alternately through the compartments thereof for the purpose of piercing the hole and driving the peg, it being understood that I don't claim in general the device of making the awl and punch act alternately with each other, as that is not new.

Fourth, I claim the rolling spur wheels on which the shoe rests, and is carried at certain times the precise distance for the series of pegs, either for single or double rows.

Fifth, I claim the manner of making the pegs by cutting them on the box or hopper, as set forth, and feeding along the card by the alternate motion of a catch operating on the points of the card.

Sixth, I claim the annular guide that supports the toe while the shoe is being pegged round the heel, and also supports the heel while being pegged round the toe.

Seventh, I claim the waved cam, for the purpose of raising and depressing the shoe, to place the pegs in alternate rows.

I am aware that one or more of the above-mentioned devices may be dispensed with in some kind of work; I therefore do not claim the whole as a necessary combination, but I use the whole for common large work, reserving the right to use less or more, as required.

OX YOKES—H. B. Hammon, of Bristolville, Ohio: I do not claim the ferrule and washers separate, for they are used for different purposes. But I claim the combination of the ferrule or its equivalent and the washers, for fastening ox bows, as set forth.

SHOWER BATH—D. P. Baldwin, of San Francisco, Cal.: I claim the manner described of combining the two directors, and providing one of them with large and the other with small discharge holes, and arranging them so as to be capable of being revolved when it is desired to vary the direction and quantity of water discharged, and thereby increase or lessen its force upon the body of the bather, as described.

Second, I claim the manner described of applying the three-way cock to the supply pipes of the directors, so that warm and cold water may be supplied at the same time, and mixed and discharged together through either of the directors, or warm and cold water supplied and discharged separately, as may be desired, as set forth.

[A notice of this invention is published on page 108, this Vol. Sci. Am.]

HAY AND COTTON PRESSES—Levi Dederick, of Albany, N. Y.: I claim, first, the bar hinged to one of the doors and capable of being removed therewith from the opening in combination with the caps, by which it is retained immediately over the ends of the two doors, effectually resisting the pressure from within and keeping them closed during the operation of pressing.

Second, providing the caps with flanges on the interior sides by means of which the bar is enabled to aid in supporting and binding together the two sides of the press during the greatest strain upon them.

[See notice of this excellent press on page 204 of Vol. 8, Sci. Am.]

FASTENING FOR EAR RINGS—G. E. Higgins, of Syracuse, N. Y.: I claim the standard attached to the knob and serving at the same time as a means of connecting the drop and as a catch to receive and secure the end of the ear wire, as described.

[This is an excellent device for fastening ear rings, etc.]

LATHE FOR IRREGULAR FORMS—Frank Baker, of Pepperell, Mass.: I am aware that in the turning lathe of said Blanchard a right last has been turned from a left last, or a left last from a right last, therefore do not claim such as my invention, but I claim the particular arrangement of the cutting cylinder, the two patterns, the patterns and the work mandrel, and their tracer rollers, whereby they are made to operate together, as described.

TRIP HAMMERS—Bernard Hughes, of Rochester, N. Y.: I claim adding to the stem or rod of the trip hammer a piston working in a cylinder open on the upper end and closed at the bottom and provided with regulating cock and valve, as described, by which means I am enabled to add the whole or such part of the pressure of the atmosphere as may be desirable, to the weight of the hammer in giving the blow.

CATCH FOR HOLDING THE BIT IN BRACE STOCKS—C. M. Daboll (assignor to himself and A. P. Daboll), of New London, Conn.: I claim the improved manner of securing and detaching the bit in and from the socket of the brace by means of the eccentric catch, and the inclined side of the notch in the shank of the bit, operating as described, viz, in such a manner that any force exerted to withdraw the bit, will bind it tighter in its place, without straining said catch, and by which a slight pressure upon the thumb lever combined with the catch, as specified, will release its hold upon the bit, as set forth.

MACHINES FOR CUTTING GLAZIERS' POINTS—Ward Eaton, of Carbondale, Pa.: I claim the combination of a partially serrated or indented and straight cutter, having a reciprocating vertical motion, with a stationary blade, so that the serrated part of the blade shall cut out one half of the sheet in points, and at the same time form two of the three sides of the remaining points of the sheet, which are cut therefrom by the straight blade, and thus cut up the entire sheet without waste; and this I claim only when said cutting edges are so inclined to each other as that but one point of the series from the sheet shall be cut off at a time, which prevents their warping or bending, as described.

POTATO DIGGERS—C. H. Dana, of West Lebanon, N.H.: I claim the revolving separator, as described, for the purpose of breaking up the raised furrow slice, and separating the potato therefrom.

GUN LOCKS—James Hults, of Berlin Township, Ohio: I claim the combination with the tumbler of a lock of the jointed levers, and the spring, for the purpose set forth.

I also claim the set screw, arranged in such a manner in relation to the jointed levers, the seat, and the tumblers, that by its adjustment the cock can be detached from its cocked position by a greater or less exercise of power upon the trigger, as set forth.

HANGING GATES, ETC—N. W. Cilley, of Nottingham, N. Y.: I am aware that a system of connecting levers or links, have been used, called the parallel motion, for connecting the end of the working beam with the piston rod in steam engines, and that the same arrangement has also been applied to other machines to impart a rectilinear motion from a vibrating circular motion, and therefore I do not wish to be understood as making claim to any such device.

I claim the method of suspending gates or other structures to bracing levers jointed to each other and to the gate or other structure, and to fixed work, as specified, for the purpose specified.

MACHINERY FOR COMPOSING TYPE—W. H. Mitchel, of Brooklyn, N. Y.: First, I claim the combination of the lip with the lifting bar, 52, with the bar, 50, as specified, the said lip acting as a stopper against which the line of type lies in the inclined conductor, and over which the bar, 52, lifts the bottom type, so that it falls on the bed, as specified, and the said bar, 50, being so adjusted as only to admit of one type at a time being lifted, as specified.

Second, I claim constructing the composing wheel of their circular plates with teeth therein, so as to receive the type from the conductor, in combination with the plates which pass between the circular plates and receive the type, preventing their further descent, and passing them in line into the groove as specified.

Third, I claim the tongue to prevent the type jumping over the teeth in the composing wheel, as they pass down the inclined conductor, as specified.

FIRE ARMS—Jeremiah Peck, of New Haven, Conn.: I claim the combination of the independent lever with the cylinder, when so arranged that the cylinder may be revolved and locked, without reference to, or the use of either the hammer or trigger, and the whole constructed as described.

I also claim the combination of the spring shield with the cores or nipples, when so arranged as to cover and protect the caps without any risk of injuring them, or moving them out of place, and also serves to prevent the recoil of the cylinder, when constructed and combined, as described.

PORTABLE GRINDING MILL—Lyman Scott, of St. Louis, Mo.: I claim the alternate deep and shallow sections of furrows upon the main grinding surface of the burr, for the purpose of distributing the material over said surface, and preventing a surplus or clogging upon any one point of said grinding surface, as described.

I also claim the method of supporting the shell, and adjusting the bar therein, by means of the lower bridge tree, grooved legs, sockets, and adjusting screw rods, when said legs serve the double purpose of supports to the shell, and guides to the bridge tree, as described.

SAW—Linus Stewart, of Washington, D. C.: I claim the construction and arranging of the saw teeth, as described, that is, each tooth shall project the next one below it a distance equal to the depth it is intended to cut, and each tooth having its forward edge or sole vertical and parallel to the corresponding edges or soles of all the other teeth, as set forth.

MACHINE FOR PAGING BOOKS—H. S. Taylor, of Spring field, Mass.: I claim the described type holder, as set forth.

I also claim the peculiar combination and arrangement of the spring catch, the dog, the ratchet wheel, and the pawl, whereby the printing cylinder is held firmly clamped during the operation of printing, and is revolved a sufficient distance to bring a new number over the platen, as set forth.

GUITARS—W. H. Towers, of Philadelphia, Pa.: I claim first, passing the string through openings in the pins extending from end to end, and over their flared and rounded heads, and thence to the head of the finger board of the guitar, for the purpose of increasing the volume and richness of its tones, as described.

Second, I claim extending the two center pins to the bottom board of the guitar against which their lower ends are made to press by the pins, so as to cause them to act as sounding posts in addition to serving as holdfasts for the strings, as set forth.

ATTACHING BLANKETS TO CYLINDERS FOR PRINTING PRESSES—Wm. H. Street, of New York City: I claim attaching one end of the blanket to the cylinder by a row of pins, arranged within the cylinder on one side of the opening which receives the gripper shaft, and the other end to a toothed bar, which occupies a position within the cylinder, and has a screw applied in any way substantially as described, to draw it inwards to tighten the blanket.

MITER BOX—Matthew Spear of Bowdoinham, Me.: I claim the two supporters or chamber bearers, connected and turning about a common center, in combination with the saw guide attached to the same pivot, and so connected by mechanism with said supporters as to cause it at all times to bisect the angle at which the supporters may be set.

I also claim the turning of the saw guide from its vertical position, as set forth, for cutting any desired angle with the plane of the lumber supporters, as specified.

OX YOKES—I. W. Little, of Newbury, Mass.: I claim making the yoke in two parts, scarfed, bolted, and confined together, as set forth, and combining with them the sustaining chains, the chain holder, and the stirrup screw and nut, as specified.

SELF-HEATING SMOOTHING IRONS—P. S. Howes, of Boston, Mass.: I do not claim the combination of a rotary box, a supporting bale, or handle, and a spirit lamp, the box being provided with the two smoothing faces or surfaces of flats, and made to turn around within the handle, so as to bring either of them downwards after it has been heated by the flame of the spirit lamp.

But I claim the mode by which I prevent the swashing of the alcohol in the lamp for causing too great or sudden a flowage of the alcohol through the wick, meaning to claim the air vessel, in combination with the tube, its seat, and the capillary covering, the same being applied together, and in the reservoir of the lamp, and to the wick thereof, and made to operate as specified.

LATHE DOG—David M. Smith, of Springfield, Vt.: I am aware that there is nothing new in a screw stirrup as applied to the mandrel or center pin of a common turning lathe, and for the purpose of confining the said center pin to the puppet of the lathe; I therefore do not claim such in this relation, but I claim combining the stirrup to the eye of the lathe dog, so that the eye part of the dog shall be made to extend through into the stirrup, and the male screw of the dog be made to screw through the stirrup and against the end of the dog, as stated.

I also claim to combine a cross bar or rod with the tines of the stirrup so that the said cross bar shall pass through the eye of the stirrup, and serve to keep the parts together or from entirely separating when not in use, as specified.

NIBBING SAW TEETH—P. B. Tyler, of Springfield, Mass.

I do not claim the making a saw with a detachable teeth where the whole of each tooth is constructed in one piece and detachable from the body or plate of the saw.

I claim the improved mode of making and fitting each tooth, the cutting nib being made so as not only to embrace a nib made in the tooth or body of the saw, but to rest in an angular notch formed as stated, at the front of the rib, the nib being secured in place by rivets, as specified.

CASE FOR HOLDING RAILWAY OR OTHER TICKETS—Joseph Edmondson, of Salford, Eng., and Caleb Haworth, of Marsden, Eng., executors of Thos. Edmondson, late of Salford, Eng.: We do not limit ourselves to the details set forth, as the same may be varied; but what we claim is the case, as shown, for holding railway or other tickets.

[This invention, together with improvements in printing tickets, will soon be offered, as we understand, to the attention of railway companies in this country.]

HYDRAULIC HEATERS—L. W. Leeds, and R. M. Smith, of Philadelphia, Pa: We claim the arrangement of air tubes, forming a perforated chest, containing the water to be heated in connection with the fire chamber therein, thus making a compact portable hot water apparatus of short circulation and efficient action, at a greatly reduced cost, as set forth.

MACHINES FOR MAKING HINGES—Edward Brown (assignor to the Scoville Manufacturing Co.) of Waterbury, Conn.: I claim, first, the slides regulated by set screws, as described.

Second, I claim the eccentric rods, sliding within hollow rods, and connected with the slides.

Third, I claim the sliding punches, with adjusting screws, as set forth.

Fourth, I claim the sliding gauge with its longitudinal motion and set screws, for the purpose of securing the hinges while turning the knuckle, as set forth.

Fifth, I claim the fast gauge with the preventor.

Sixth, I claim the slides, with the catches and the spring catches.

Seventh, I claim the gauge in combination with the preventor, for the purpose of preventing the hinge from returning with the feeding slide: the whole arranged as set forth.

MAGAZINE GUNS—E. H. Graham, of Biddeford, Me., (assignor to himself and Artemus Wheeler, of Lowell, Mass.:) I do not claim a rotary magazine connected with the barrel of a fire-arm, such being in common use in repeating guns. Nor do I claim combining a magazine nor powder, balls, and priming, with a hollow cylinder or tube, made to encompass and revolve on a gun barrel, while the said barrel is provided with holes or passages to receive the load from the magazine when the latter is turned around on it into a suitable position. Nor do I claim the combination of a rotary charge receiver (placed within the barrel or breech of a gun) and a stationary loading magazine affixed on the said barrel or breech.

What I claim is to combine with the gun barrel and the magazine when the latter is arranged and made to operate on the former, as specified; a slide cut-off and a perforated plate as made, applied and operated as described, the same enabling me not only to dispense with a rotary charger receiver, and its attendant evils, but to retain the advantages of the arrangement of the two series of powder and ball chambers, in concentric circles, on the side of the gun, and out of the sight range, and to apply to the magazine and gun barrel a contrivance which, by its peculiar operation is rendered less or very little liable to be fouled by the smoke or any gases of the explosions of the charges.

DESIGN.

CLOCK CASE FRONTS—Charles Chinnock, of New York City.

NOTE—Seven of the applications in the above list were prepared at the Scientific American Patent Agency.

Romance of a Coal Field.

The following singular circumstance, says the "London Mining Journal," happened a few years ago in Parr, about thirteen miles from Liverpool, where there are several extensive collieries. It will tend to show the immense value of coal mines which lie under a small superficial extent of land. An elderly widow lady sold to a gentleman some property in Parr, consisting of a house and about thirty acres of land, for £3,000. The old lady thought there must be coal under the land, as there is so much in the neighborhood; but it was the decided opinion of coal proprietors, and others conversant with coal mines, that there were no coals on the property. The seller of the property, however, insisted that the coal should be reserved, unless the purchaser would give her £100 for them. This he refused doing, and the coals were accordingly excepted from his purchase, and reserved to her. The old lady died soon after, bequeathing the coal mines among the children of a deceased sister, seven in number, who were all laborers, and the residue of her property, worth about £3,000, to the children of another sister. The bequest of the coal mines was considered a nominal thing, and the dissensions in the two families were great on account of it. The coal legatees brooded for a length of time over their disappointment in not sharing their aunt's property with their cousins, but at length they contrived to induce some persons, who were supposed to have more money than wit, to undertake the expense of boring on the land, to ascertain whether there was any coal or not. The boring continued for a considerable time, to the great amusement of persons connected with collieries; but at last, to their great astonishment, the chagrin of the purchaser, and the unbounded delight of the legatees, two delfs of the best coal in Lancashire were discovered, extending nearly the whole breadth of the land, and which could be easily worked. This coal was immediately purchased by the proprietors of a neighboring colliery for £20,000. On subsequent borings three lower delfs were found, which the same parties purchased for £15,000.

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New Inventions.

Improvement in Spark Arresters.

An improvement has been made in spark arresters for locomotives, by T. E. Rollins, of Hornellsville, N. Y., who has taken measures to secure a patent for the same. The object of the invention is to carry up the smoke and the sparks that may escape with the exhaust, far above the top of the smoke pipe, and prevent them annoying the engineer, and passengers in the cars. For this purpose a case with spiral ribs is attached to the outside of the smoke pipe, and this has openings into which the air is driven by the force and velocity of the engine: it cannot escape but upwards and spirally —like a whirlwind, at the top or exit of the smoke pipe. These currents of air as they ascend, give the smoke and sparks issuing from the smoke stack, an upward whirling motion, and carry them beyond the possibility of entering the cars and annoying the passengers. The evils which this improvement contemplates to remove are very disagreeable ones. We have been almost choked with smoke on railroads; we have had holes burned in our clothes with sparks, and have extinguished a fellow passenger—his clothes we mean—who was sitting on the same seat with us. We welcome any improvement that will entirely remove the abominable spark nuisance. This one will offer a little more resistance to the engine than a smooth pipe, but that is nothing at all as a drawback to be set up against the great evil it is intended to remove.

Iron Shutters.

Charles Reed, of this city, has taken measures to secure a patent for an improvement in rolling iron shutters. The improvement consists in bending or otherwise forming the slats so as to produce a recess in the form of part of a circle within each edge of the back side, one of such recesses being for the purpose of receiving the joints of the hinges or chain to which the slats are attached, and preventing it from causing so great a protuberance as is usually the case on the back side, the other being for the purpose of receiving the prominence on the front, which is caused by the recess on the back of the next slat. The circular interiors of the recesses, and the exterior prominences of the slats are concentric to the axes of the joints or hinges, and fit together in such a way as to allow the free working of the joints, and at the same time strengthen them. When the shutter is unrolled the prominences on the exterior of the slats have the appearance of a number of parallel beads, which conceal the joints and give the shutter an ornamental appearance on the outside.

Sawing Machinery.

Charles F. Packard, of Greenwich, Conn., has applied for a patent for an improvement on sawing machines for sawing laths, pickets, &c., direct from the log. It consists in the use of a vertical circular or reciprocating saw, and a series of horizontal circular saws, the latter being placed on one shaft at a suitable distance apart, said shaft being attached to a vibrating bed, operated in such a manner that the horizontal saws will be thrown outward from the carriage and log, when these are moved in *one* direction, and then thrown towards the carriage and log when they are moved in the opposite direction. When the horizontal saws are thrown in towards the log they cut into it the exact distance of the width of the pickets, laths, or whatever stuff they may be cutting, but do not separate them from the log; after they are thrown out, when the log carriage has traveled to the end of the way, the vertical cutting saw is thrown into gear or action, and it cuts out the series of pickets or laths from the log.

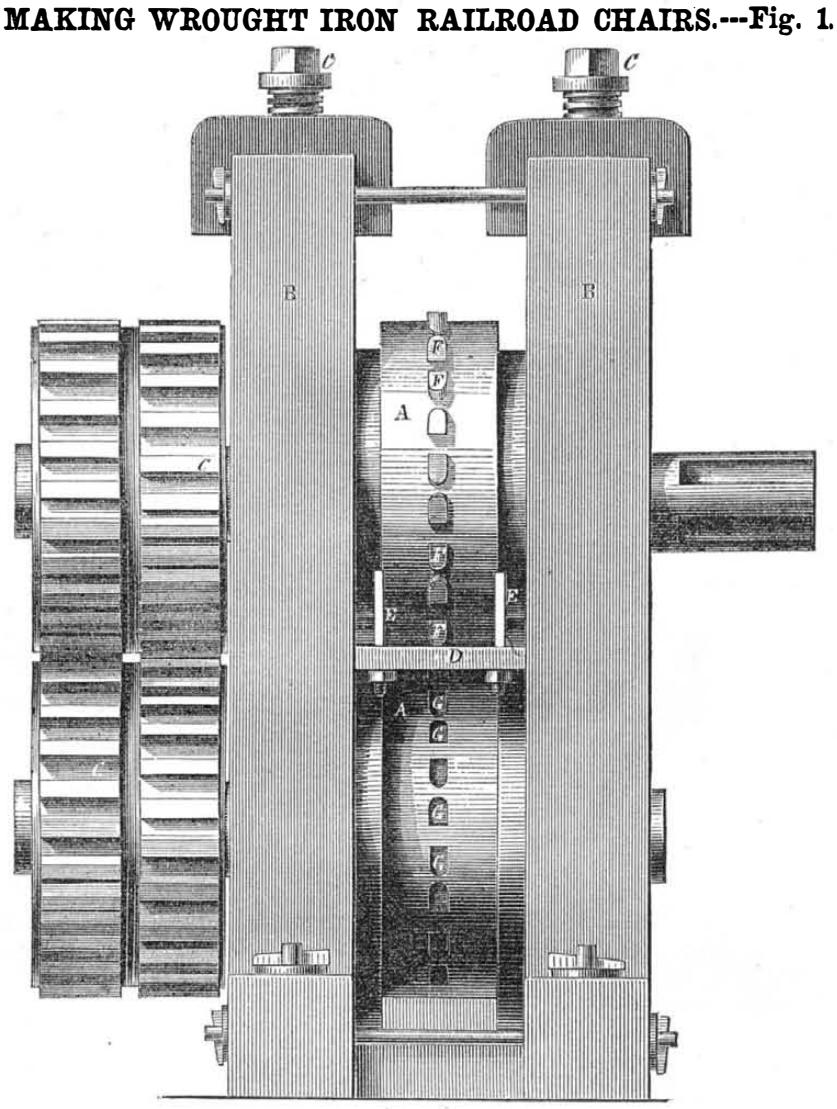
Improved Ear Ring.

Geo. E. Higgins, of Syracuse, N. Y., has made an improvement on ear rings. In the ear rings which are now in most common use a ring is attached to the *knob* to receive a similar one on the *drop* for the purpose of connecting the drop with the knob; and there is another ring or catch on the knob for the purpose of receiving the end of the ear-wire. The improvement consists in attaching to the knob a standard which serves at the same time to attach the drop and receive and secure the end of the ear-wire, thus providing the means of removing the drop from the knob without taking the ear-wire from the ear of the wearer. See claim under the proper head in another column.

Beveling Planes.

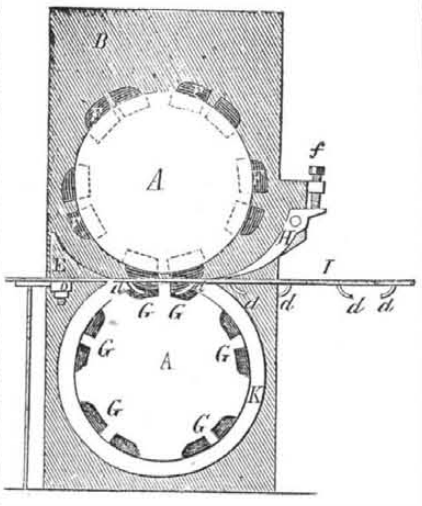
M. J. Wheeler, G. W. Rogers, H. W. Pearce, and M. B. Tidy, of Dundee, N. Y., have made an improvement in beveling planes, the object of which is to plane a double bevel or two faces at any desired angle to each other and to a third face. The improvement consists in attaching the two cutters, which are to plane the two faces, to two wings, that are both hinged or otherwise attached to the body of the plane, so as to swing round a common axis, and each of which is adjustable and capable of being secured in any position independently of the other, so as to bring and set the faces of the cutters at any angle to each other, or to the face which is employed to guide the plane. Measures have been taken to secure a patent.

MAKING WROUGHT IRON RAILROAD CHAIRS.---Fig. 1.

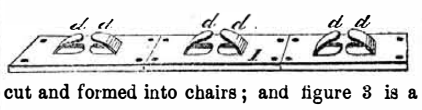


The annexed engravings represent an improved machine for making wrought iron chairs for railroads, for which a patent was granted to John C. Ogden, of the city of Philadelphia, on the 4th of last month (April 1854.) Figure 1 is a front elevation of a pair of chair-making rolls, with connecting pinions and housings, and figure 2 is a small cross-section of a pair of rolls, having the cutters and dies for making the chairs, and with a bar of iron being

Fig. 2.



3



cut and formed into chairs; and figure 3 is a perspective view of the chairs formed by this machine. The same letters refer to like parts.

A A are the rolls; B the housings or frame; C C the gearing pinions; D the guide bar; E the guides for directing the chair bar to the rolls; F the punching cutters; G the dies; H the adjustable lever for forcing the punched bar of iron, I, off the punches as it passes from between the rolls, A A, and of the screw bolt for adjusting the lever, H; *d d d* are the lips formed by the punches on the bar of iron as it passes through the machine. The rolls are geared together by means of a pair of pinions with alternating teeth, and revolve in bearings secured within the housings and adjusted by screw bolts, *c c*, in the usual manner.

The punching cutters and dies are arranged around the peripheries of the rolls, the punches being screwed firmly into the upper roller, and the corresponding dies or recesses made in the lower one. The lower roll is made with a groove to correspond with the intended width and thickness of the bar of iron to be punched or formed into chairs (say about six and a half inches wide and half an inch in depth) the upper roll having a projection around its periphery, accurately adapted to the groove in the lower roll. The punches are screwed into the upper roll in pairs, and shaped to suit any particular form of lip that may be desired on the chair to be made. The shape represented in the engravings is perhaps one of the best, yet any other form may be adopted and constructed on the same machine, by changing the punches and dies, or the rolls. The lever, H, is made in width to fit within the groove in the lower roll, and has a slot in its inner end, large enough to allow the punches to pass freely. The frame or housings, and the rolls and pinions should be made of cast-iron. The rolls may be from two to four feet in diameter, and should be turned true and accurately fitted together. The punches should be made of cast-steel and properly hardened, and as the dies should also have their upper edges of cast-steel, it is intended to have the collar or projecting part, K, on one end of the lower roll, adjustable on its shaft, so that a band of cast-steel, (about half an inch thick and of the same width as the groove in the roll) may be shrunk on and hardened upon the roll, the dies or recesses being first properly cut through the bar. This collar or projecting part, K, is then to be secured up against the edge of the band and keyed to the shaft. In this case the cast roll must of course be turned down sufficiently to allow for the thickness of the band. The two rolls are made, each of about the same diameter at the part where the punches or dies are placed, or where the chair-bar passes between the rolls. The machine is intended to be geared into connection with a steam or other engine. The rolls being adjusted apart to suit the thickness of the chair bar, the iron out of which the chairs are to be made is entered between the revolving rolls whilst it is hot, and the dies and punches are kept cool by cold water running upon them. It is intended that the chairs shall be made from the mill bars direct from the finishing rolls without reheating.—The bar is run through between the rolls, thus forming the lips, *d d d*, and is then taken to the shears and cut into separate chairs; they are then punched at the corners for the spikes, and dressed up for use. The spike holes and lines of separation between the chairs are shown in figure 3.

This appears to be a good machine, capable of making the *chairs* with great rapidity and economy.

More information may be obtained by letter addressed to Mr. Ogden, at No. 106 North Third street, Philadelphia.

Cotton Press.

Robert Adams, of Knoxville, Tenn., has taken measures to secure a patent for an improved cotton press. The nature of the invention consists in a peculiar arrangement of levers, whereby the cotton is subjected to pressure both at the top and bottom of the box, and the operation of pressing the cotton is managed with greater facility than lever presses of common construction.

A Warm North Lake.

The "Quebec Chronicle" says that nearly due north of Quebec, one hundred and eight miles as the bird flies, and probably one hundred and thirty by a constructed road, lies a magnificent lake, covering an area of 600 square miles, and abounding with a variety of fish. It is fed by numerous rivers, some of them navigable for a considerable distance to schooners and batteaux; it is the lake St. John —from it flows the "Great Discharge," or main stream of the Saguenay River as far down as Chicoutimi, a few miles beyond which the river is navigable to ships of the heaviest tunnage. On either bank of this river may be seen a flourishing settlement; the soil is of a rich and loamy nature, producing wheat, corn, fruit, &c., equal in quality and quantity to any raised in Upper Canada, and although 1½ degrees further north than Quebec, yet from the peculiarity of its geographical position, its climate is milder in winter than that of Montreal. For many miles on both banks of the river, as well as along the shores of the lake, are thousands of acres of the finest land, covered with a noble forest.

The Salt Lake of Utah.

Experiments have been made upon the properties of the water of Salt Lake, Utah, for preserving meat, by Mr. Stansbury and his associates. A large piece of beef was suspended from a cord and immersed in the lake for over 12 hours, when it was found to be tolerably well cured. After this, all the meat they wished to be preserved was packed into barrels without any salt whatever, and the vessels were then filled with Lake Water. No further care or preparation was necessary, and the meat remained perfectly sweet, although constantly exposed to the atmosphere and sun. They were obliged to mix fresh water with the brine to prevent the meat becoming too salt for present use.—[Ex.

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Scientific American.

NEW YORK, MAY 27, 1854.

The Chemistry of Tea.

Without experiment upon the living organism, no person can tell, from the chemical composition of any substance, whether it is healthy or deleterious—useful for food or drink, or dangerous to life, as a poison. What is the reason that a few grains of the oxyd of arsenic, when taken into the stomach, will, in a few minutes, curdle the fountain of life and arrest the revolutions of "the wheel at the cistern?" We cannot tell; and we cannot advance a single argument why the same quantity of the oxyd of iron, or zinc, as that of arsenic, may be taken into the stomach with impunity: we only know that such is the fact. Chemistry, as a science, is totally different from mechanics; it is strictly practical, made up of recorded experiments, while mechanics is based, in a great measure, upon abstract reasoning. Chemistry is full of mystery; and yet from the many experiments which have been made and recorded, it presents a broad page of beautiful revealed truths. The vital air that we breathe is composed of the same elements as the poisonous *aqua-fortis;* the sugar with which we sweeten our tea is composed of the same elements as alcohol—carbon, hydrogen, and oxygen; and the theine of our tea,—that which is its exhilarating active principle—is composed of the same elements as the "morphine" of opium. Theine exists in tea and coffee, and is composed of C.8 H.5 O.2 N.2 (carbon, hydrogen, oxygen, and nitrogen.) The water that we drink is composed of oxygen and hydrogen; the air that we breathe is composed of nitrogen and oxygen, and the beef that we eat is principally composed of carbon, hydrogen, oxygen and nitrogen This latter body is the substance of which our muscles are, in a great measure, composed, and yet chemistry unfolds to us the astounding fact that many of the vegetable substances which contain nitrogen in a large proportion, exercise a dangerous influence upon the human system when introduced into the stomach. Prussic acid, morphia, quinine, the conia of hemlock, the nicotine of tobacco, the brucia of nux vomica, &c., are distinguished by the quantity of nitrogen they contain. The *theine* of the tea, which is one of our common beverages, being of that class of vegetable bodies which produce powerful effects upon the human system, may also be expected to exercise a striking influence upon those who use it. Now what is that influence? Some pretenders to scientific lore would conclude that tea was a deadly poison, because its distinctive principle—theine—is like that of nux vomica, —composed of the same elements. The composition of strychnine is C.44 H.24 O.4 N. It is only by observing the effects of any substance upon the human or living being that we can derive a correct knowledge of it. From the mere composition of strychnine no one could tell whether it was a poison or not, for gelatine —pure glue—is composed of the same elements (C.13 H.10 N.2 O.5,) and yet no one will pretend to say that the gelatine—that substance which imparts the sweet taste to our meats—is a poison; and yet some professedly wise men have condemned tea, simply because, as they say, "it contains a substance—theine—which has the elements of a class of poisons like morphia and strychnia."

This much we have premised to show the absurdity of any objections that may be urged (and which have been urged) against the use of any beverage or food, from its chemical composition, and not its actual workings on the human system.

All nations except those actually below the scale of humanity—those who do not know the use of fire,—use some exhilarating beverage, and "it is a curious circumstance," says Prof. Johnston, "and one rich in materials for reflection, that in countries so remote from one another, the tea of China, that of Paraguay, and the coffee of Brazil, plants so very unlike, should have been, by a kind of instinct, as it were, selected for the purpose of yielding infusions capable of being employed as gently exhilarating and refreshing beverages, capable of supplying a natural craving or a want felt by all." It is well known that the living being is undergoing constant decay and renovation. The labors of life waste the body, and we take food to renovate it. The observed effects of tea upon the system is that of lessening the natural wear and tear of the body; it prevents the waste of the tissues, and performs an important office in the animal economy. By the consumption of a certain quantity of tea, the health and strength of the body will be maintained to an equal extent upon a smaller supply of common food. There are between three and four grains of theine, in half an ounce of good tea, which may be taken by a full grown person in one day, but more than this tends to quicken the pulse, and increase the action of the heart. In Australia, however, where tea is plentiful and cheap, a bushman, who is continually exposed to the open air, thinks little of putting a whole ounce of tea into his kettle at once. In the use of tea there is much danger to those who are blamed for using more of it than others,—we mean those who are devoted to sedentary occupations. Tea is of more benefit to the hard-working man than to this class, as it is not the prevention of waste in the tissues that sedentary persons should look to, but to a greater increase of that waste, by labor or exercise in the open air.

As we said last week, in speaking of the use of tobacco, so we speak of tea; we have no doubt but people could live cheerfully and healthily without ever using a particle of it; our fathers in days of yore did without it, and we believe their years were no less than those of their descendants. But that is not the proper way of philosophizing. We find that, like tobacco, the use of tea, in spite of pulpit and press, has also marched onwards with conquering strides, until it has now become a daily necessity in almost every family, in many countries where its very name was unknown two centuries ago. The amount raised in China annually is 2,200,000,000 lbs.; that consumed in Britain 55,000,000 lbs., but although we have a plentiful supply of coffee statistics, we have not been able to learn how much tea is yearly consumed in our country, probably half as much as Britain, as we use more coffee and less tea than the people of England. The use of tea, like that of tobacco, is one of profound interest to the man of science, the statesman, and philosopher—chemically, as it relates to its effects on the human system, and politically as it relates to the vast sums expended for it as a daily domestic beverage.

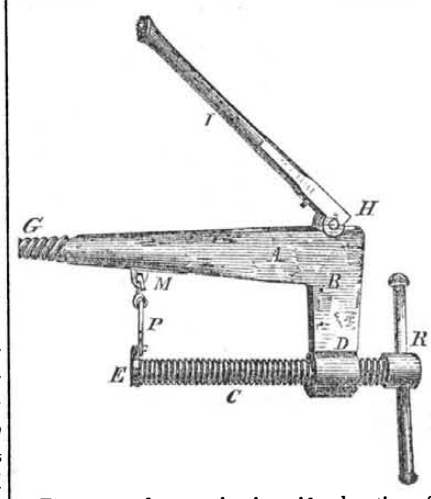
Reduction of Patent Fees.

The present Commissioner of Patents, in his Annual Report, recommended a reduction of patent fees to foreigners, especially to subjects of Great Britain, against whom an invidious distinction is made, by charging them $200 more than all other foreigners. We have not heard that the Senate or the House of Representatives have paid the least attention to the able and just remarks of Judge Mason, and we think they have not. Party warfare and the strife of contending leaders in Congress, seem to absorb more time than to us appears necessary in legislation. We have advocated a reduction of fees to foreigners, for a numbers of years, and we had hoped that some attention to this just and reasonable reform in our patent laws would have been paid by Congress before this time, but we have been disappointed, and the present statute still stands on our books a disgrace to those who made it, and those who neglect or refuse to abolish it. We desire that every reasonable protection should be allowed to foreigners, and we want every useful improvement introduced, let it come from what source it may. Our country is more indebted for its physical prosperity at least, to improvements in the useful arts, than any other causes. Let the inventors then, of every country, be encouraged and allured to introduce their improvements into our country by reducing our patent fees to a reasonable and just standard, instead of an almost prohibitory one. The fee for all foreigners which we have suggested is $100. We think this a reasonable one, and high enough to cover all expenses of the Patent Office. Will the Commissioner of Patents endeavor to get this reform carried out at this session of Congress? All depends on his influence and efforts.

The New Process of Making Bread.

The expose which we made on page 277, of an article with the above caption, which we stated had been published by many of our cotemporaries without a word of comment, has also been exposed in a number of the "London Journal of Arts," received by us last Tuesday. The writer who exposes the new process is Henry W. Revely, who states that if the discovery had been to *reduce* the number of loaves of bread in a sack of flour, instead of increasing them, it would have been a good one. He states that London bakers use every fraudulent effort to increase the number of loaves of bread made from a sack of flour, and do not need any new lessons in such practices. "Nothing more is requisite," says he, "to produce good wholesome light bread, than flour made from well dried new wheat, pure water, and a little sweet leaven." He is right, and writes apparently with a good knowledge of his subject.

Screw for Planking Ships.



The annexed engraving is a side elevation of a tool named a Self-Holding Plank Screw, for which a patent was granted to Solon Staples, of Topsham, Me., on the 20th of last December. When using this machine in planking ships, the screw, G, is inserted into the proper timber, and the jointed lever, I H, which has a serrated face on its knob end, acts as a brace on the timber. This is done before the plank to be worked is taken from the steam box. When the plank is set to be operated by the screw, the eye plate, E, on the foot of screw, C, rests upon it, and by turning said screw by the lever, R, it works down through the screw collar, D, and forces the plank—against which E abuts—with great power into its proper place. The ring plate, E, of the screw, C, is connected by link and eye, P and M, to the stock, A, of the tool, and the collar, D, is made in the shoulder, B, of the stock.

The patentee says of this instrument: "It has combined in it the ring bolt, rein-staff and rope, cleat, set-bolt, and most of the wedges. Two men, with the use of these machines, will work a hot plank to its proper place in half the time that four will with rein-staffs. With this machine the workmen have comparatively nothing in their way on the stage. The safety of workmen on and under the stages, when planking with these machines, is much greater. For sealing, where great power is needed and timbers are compact, so that it is difficult working the plank where it is intended to go, this machine works well. Also for bringing the butts of stubborn planks to their proper places, planking round sterns, holding quarter-pieces, channels, house sills, comings, hooks, &c., until they are fastened. I believe this self-holding plank screw to be the most time saving and the safest machine ever used for planking."

More information may be obtained by letter addressed to Mr. Staples, at Topsham.

Small Pox.

The British Parliament has passed an act making it a finable offence to every parent or guardian who neglects to have his or her child vaccinated within four months after its birth. A Registrar is appointed for every parish to see that this law is enforced. The rapid increase of small pox in that country has led to the enactment of this law—a very salutary one. Such laws have been in force for a number of years in Prussia. If small pox increases among us for the next three years, as it has during the past two years, such a statute will be required for our State.

Woodworth's Patent Planing Machines.

We had no idea of the extent of the manufacture of the above named machines in this neighborhood, until we visited the machine shop and foundry of John H. Lester, No. 57 Pearl street, Brooklyn, on Friday last week. An advertisement on another page mentions the peculiar qualities of the machines which are made in his manufactory, but there is no better testimony to the character of his productions than the large business which he has built up within a few years, and which he now carries on. We saw eight new machines on the floor in different stages of progress, and two new ones are finished every week, thus making over one hundred per annum. Those that we saw were strong and accurately built in all their parts. Mr. L. also builds some excellent steam engines and other machines, but his great business is that of making and repairing the Woodworth planing machines. As many of our readers give this old and well-known machine the preference over those of more modern date, we thought we could not render them a more acceptable service than by imparting the above information, so that they may know where to procure machines of a reliable character.

The Wheeling Bridge Blown Down.

We regret to state that the great Wheeling Bridge was blown down on the afternoon of the 17th inst., during a terrific storm.—All the cables except two were twisted and broken to pieces, and the bridge thrown down into the river bottom upwards. Whether it will be rebuilt or not we cannot tell. This was the largest suspension bridge of one span in the world. It was 1010 feet from center to center of the supporting towers, and the hight of the flooring was 97 feet above low water mark. Charles Ellet, Jr., C. E., designed and built it. Its cost, we believe, was about $145,000, and was only finished about five years ago. It was a source of pride to the people of Wheeling. An injunction by the U. S. Supreme Court ordered it to be taken down, but it was saved by an Act of Congress. It has been subject of no little interest and excitement to our whole country since it was erected. It does not appear that long suspension bridges are very safe structures.

Iron Cottages.

We have been informed that an Association has been formed in the city of Brooklyn for the purpose of building iron structures, especially the cheaper kind of cottages. It has been asserted that they can build a very neat cottage for about $500—one half the price of a frame one of the same dimensions; this we believe is not possible; at least we think that iron houses built for such prices must be of very little worth. We do not know how much metal would be required for a two story cottage, but $500 can purchase 25,000 lbs. of common coarse castings, or at 4 cents per lb., the price of fine castings, it would purchase 12,500 lbs.—a little over six tuns. The house indeed must be very small, or the castings very light, that will not weigh more than this amount of metal. We, however, sincerely wish success to this Association, and hope it will be able to introduce a cheap ornamental and solid class of iron structures of the cheaper kind.

Sugar and Molasses.

The number of sugar houses in operation in Louisiana, last season, was 1437, of which 956 were worked by steam power, and 481 by animal power. The number of hogsheads produced was 449,321, equal to about 495,156,000 pounds. The quantity of molasses was 37,000,000 gallons.

The New Haven Railroad Company have already paid out $250,000 for damages arising from the Norwalk disaster, and have yet to pay $50,000 more, making in all $300,000

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American Association for the Advancement of Science.

MET IN WASHINGTON IN THE LAST WEEK OF APRIL, 1854.

ARCHITECTURE, LECTURE ROOMS, AND THE SMITHSONIAN INSTITUTE.—Prof. Henry, of the Smithsonian Institute, read an able paper on this subject. He said: "Architecture should be looked upon more as a *useful* than a *fine* art. It is degrading the Fine Arts to make them entirely subservient to utility. It is out of taste to make a statue of Apollo hold a candle, or a fine painting stand as a fire-board. But our houses are for *use*, and Architecture is substantially one of the useful arts. In building, we should plan the inside first, and then plan the outside to cover it. Buildings should have an ethnological character. They should express to other ages the wants, customs, and habits of the age of their construction. A Grecian temple was intended for external worship. An old Greek would laugh to see us construct a Grecian temple for a Treasury building or a meeting house. It should have no windows in it, and should be entirely too dark for such uses. But it is easier to copy than to originate, and hence our servility. The *material* should alter the character of the structure. The Crystal Palace was, *par excellence*, *the* building of the nineteenth century. Its material, its history, its purposes were unprecedented. It is a want of the times to build so that our houses can be taken down and transported.

The mo t flourishing time for Architecture is while a people are in a semi barbarous state. The Press supplants it in importance when it comes into use. A Gothic cathedral is good to worship in, but not at all fitted to preach in. A building admirably adapted to the wants of the twelfth century, would be strangely out of place in the nineteenth.

The mind has no *innate* cognitions of beauty in architectural details. The stout marble pillar we recognize as essential to the support of a heavy weight only until we find a stouter pillar of greater ability to support weight, which yet may be of smaller dimensions. A bronzed iron pillar of a few inches diameter satisfies the mind; but if we paint it to look like stone, it seems insufficient, and our taste is shocked.

A lecture room should be so built as to exclude the external light that is not needed within, and prevent the waste of light from our lamps within. The room we are in is faulty there. There should be no unnecessary void space to waste the heat, and light, and voice upon. Ventilation being properly cared for, the ceiling may be made quite low. The audience should be as near as possible to the speaker. The speaker should be placed as high as possible consistent with good seeing on the part of the audience. What they call the Katoptric curve, if observed, gives every auditor a chance to see as well as to hear. It requires that the seats should so rise as to allow a direct line from the eye of each one to pass to the speaker unobstructed by the heads in the seat before. The resonance of the room must be heeded. The room, large or small, will echo if naked and empty and the walls are hard; and the larger it is the greater the danger of echoes. Drape one or two sides of a room, and by absorbing the sound you prevent the resonance or echo. But do not drape the wall behind the speaker. He wants that to assist his voice in reflecting the sound to the hearers. For until you pass without "the limit of perceptibility," the reflection of a sound helps the hearer in gathering in the words spoken. A damp wall is not so likely to give an echo as a dry one, nor a thin as a thick one. An open door ahead of the speaker wastes his voice. The room should be so arranged that the audience may be as nearly as possible before the speaker. Wing walls, cutting off the corners, are of service, both for reflecting the sound and for the hanging of pictures, drawings, maps, &c., so that they may be seen by all present.

But this is the easiest part of the subject; how to arrange a room where the speakers are to occupy different parts of a room, is far more difficult."

Prof. Dewey, of Rochester, spoke of the *model* lecture room in Rochester. It was 80 by 60 feet, and 21 feet high. The speaker stands on a platform perhaps five or six feet high. The seats do not rise at all until you come within four or five of the back seat. All can see easily, except when a very short man gets behind a very tall one (or, he might have added, as they used to, as an argument against the sexes sitting promiscuously in our Puritan churches, behind a bonneted lady); and you cannot get up an echo in it.

Sounding Boards.—Prof. Hackley, of Columbia College, New York, asked if any had tried the virtues of the Parabolic Sounding-board. He had read in a British journal of one used effectually in an English church. He noticed that in Trinity Church, New York, while they were striving long and earnestly to make the voice of a preacher audible in that building, from week to week a Parabolic Sounding-board was used, turned first this way, and then that, but with no good results, till at last it appeared no more.

Opinions were freely given by members that it would not be of service.

Prof. Henry also gave a concise history of the Smithsonian Institution, in which he stated that the original grant of $508,000 is untouched: that the building, which will soon be completed, is built with the interest which has accrued on the principal, and that $150,000 besides will be added to the principal, making a powerful fund. Congress, by law, has directed the formation of a library, a museum, a gallery of arts, and the delivery of lectures. These are admirable ways of *diffusing* knowledge among men, (particularly among the citizens at Washington,) but the *Will* says, "to increase and diffuse knowledge among men"—all men, —and to *increase* as well as *diffuse* it. Hence, the Regents have spent little on these objects. The Institution has just got ready to publish, and is about to issue, a "Treatise on Winds," presented to the Association, which would not have been published at all if not by it. It is a very valuable work, and it costs from $2,000 to $3,000. This is the policy of the Institution, to avoid publishing anything which any other party could publish as well.

[We must reiterate here what we said about the Smithsonian Institute, on page 20, this Vol. "Scientific American,"—it has not yet been so managed as to come up to the spirit and language of the "Bequest." A Cincinnati sage has charged us with attacking the Smithsonian Institute, in the article referred to, but that was no *attack*. We presume that the Professors and officers of the Institution agree with us in most of our remarks. The following is a letter written from a disinterested source, which we take occasion to introduce here, to show how our remarks have been apprec ated.

Smithson's Views.—MESSRS. EDITORS—Your article on page 205, "Scientific American," on this subject, is before me, in which you question the present manner of carrying out the views of Smithson, in the Institution as established by his liberality in this city.

I regret to state that there is too much reason for the complaints made. Smithson was a *practical* man—truly, as you say, *democratic*—in his views having reference to the good of the masses of his fellow men, and hence we may understand his meaning in the expressive words of his will, to "*increase and diffuse knowledge among men.*"

The undersigned was at the seat of government when this gift of Mr. Smithson was received, and the subject of carrying out the views of this benevolent individual was referred by the President to the Hon. Joel R. Poinsett, then Secretary of War, than whom no man was better qualified to understand and carry out the views. Enjoying the confidence of this excellent officer and friend to suffering humanity, the undersigned was called upon, in his official capacity (as Government Architect) to present plans for the same, and his views in relation to the spirit of the generous founder of it. He entered upon this duty with great interest and zeal, and presented the following Report.

[That part of the Report which relates to the building and laying out the grounds, which we sincerely regret has not been acted upon, we omit.—ED. SCI. AM.]

If I might digress to speak on the subject of this Institution to carry out the views of the benevolent founder, and of the most efficient means of doing so, I would respectfully present the following plan of operation:—

The most effectual means, it must be conceded, of increasing knowledge, is by verbal instruction, and to diffuse it by the free action of the printing press. Any plan, therefore, which would embrace a system of free lectures upon every useful subject, and which will contribute to improve the moral and physical powers of man, in his double capacity, would most certainly tend to the increase of knowledge. And where the lecturer could not go to instruct, or the people come to hear, the free circulation of the printed tract would tend most widely to diffuse this knowledge.

But to carry out the system to its full extent, the Institute could or ought to educate and prepare suitable persons to write out and deliver free lectures in other places, distributing, *pari passu*, the substance or pith of such lectures among their audiences.

When this system shall have worked through our country, the Institute may extend its benefits to other countries and other people, clothed in our own peculiar tongue, with our English translation, and thus, from this simple fountain, might flow out, in time, such streams of knowledge as would diffuse the light of truth and practical knowledge to every benighted people.

The valuable improvements in the printing press, and in the manufacture of paper, the increasing facilities of transportation, throughout the world, give a semblance of success to such a vast work; and here may be the nucleus—the germ of it. As it is capable of being reduced to practice, at little expense comparatively, its powers may be soon tested.

ROBERT MILLS,
Architect Public Buildings, City of Washington, 1838.

LIFE AND ITS PHYSICAL ASPECTS.—The following paper was read by Charles Girard, of the Smithsonian Institute:—

"Animated beings manifest a two-fold nature, one material, the other spiritual. The material or physical nature assumes a form, a shape peculiar to each species, constituting bodies tangible and visible to the senses. Call the latter an immaterial principal, or spirit, it matters not what, but let it be acknowledged as a condition *sine qua non* of the manifestation of the physical. To it are to be referred the moral acts and the moral tendencies which belong to the domain of moral philosophy.

The different phases through which the physical individual passes, from its formation up to its last stage of existence, constitute the physical aspects of life; or, in other words, the law under which a physical being starts is the law under which it lives during existence.

The author then proceeds to consider the ultimate process of organic life; that is, the elaboration of matter, its assimilation and transformation into the various parts and organs it assumes, dividing his subject into the following heads:—

1st. The organs and tissues are all composed of cells diversely modified.

2d. The first aspect under which an animal manifests itself is a cell.

3d. Its subsequent growth is but a simple multiplication of cells.

4th. The nourishing of the body is the mere replacing of decayed cells by new ones.

Now, if the cell be considered the elementary part of the organic tissues, we can say there are no organic elements, for however simple a cell may be, its existence implies the presence of two substances or elements—an internal or inclosed substance, and an external or inclosing substance. A cell, therefore, does not arise from one element. Oil or liquid fat and albumen, examined microscopically in their primitive state, exhibit no structure of any kind, but when brought in contact, almost instantaneously, cells are formed. They may then be produced artificially. From experiments made, it has been ascertained that the oil is the inclosed portion of these primordial cells, while the albumen constitutes the enveloping membrane. Cells thus produced artificially, however, though precisely similar to those formed by the natural fabric, will not undergo further progress. Life cannot be imparted artificially; vitality is not within the reach of experiment.

In all organized bodies, however, there is a wearing away of the constituent particles of which their various organs are composed. Each physical or mental exertion involves the destruction of materials, requiring the aid of nourishment to sustain and maintain the balance between the growth and loss of these bodies. Sustenance is necessary, and of the most varied kind. The wants and propensities of the various species of beings are different; different food must be selected by different races, and other means adopted to preserve their perpetuity of existence.

Allusion was also made to the subject of digestion, the formation of chyme, chyle, the lymph, fibrine, blood, and other fluids by which the process of life is maintained, and facts were adduced, showing that the entire economy of organic bodies is but an elaboration of cells, the immaterial or spiritual principle, which resides in them all, disposing of and arranging the cells according to the plan stamped upon each species. The constituents of the blood, its circulation, and the very important part it bears in preserving and maintaining the other functions of the body in a state of health and activity, were made a particular point of consideration.

In speaking of nutrition, the author said, "This is the last word in physiology; the last word of physiology is the first word in clinical medicine; a science which, without the aid of physiology, would be but an art. Surgery or operative medicine rests entirely upon anatomy. The better the human organism is known to the operator, the better will his operations be performed, so that the last word of anatomy will be the first word of surgery. At the bottom of physiology and medicine—clinical and operative—will be found embryology."

MACHINE ARITHMETICIAN.—Prof. Pierce, of Cambridge, expressed his opinion that a better system of computation than any set of tables could furnish would yet be provided for us by the ingenuity of learned mechanics; and on the blackboard he made a diagram of a machine which seemed to him theoretically adequate to the task. Mechanics whom he had consulted had their hopes, too, but they did not assent to the practicability of his theory.

Prof. Henry, (of the Smithsonian Institution) said the machine, Man, was subject to extraordinary perturbations, according to his feelings, which in turn waited on good or bad digestion. The "calculating machine" of the mechanic never suffers from indigestion, and once right, never errs. The value of such machines, then, is very great. They save prodigious labor.

[We believe that the British government has paid out a great amount of money for Babbage's Calculating Machine for the Royal Observatory, but whether it is used now or not we cannot tell.]

TWINKLING OF THE STARS.—Prof. Rogers, of Virginia, expounded his belief as to Irridation. He did not claim to any novelty in the facts presented, but this was new,—the separation of the phenomena of irridation into two distinct kinds. When, said the Professor, the sun glances from the surface of a polished steel ball, or when we observe any brilliant light near the eye, the center of illumination is surrounded by a circle of rays, which are not stationary, but seem to have a pulsatory motion, and the pupil of the eye contracts to protect it. This is radiation of one sort. The second sort we see on observing light at a distance, as the stars; or lights which are only bright comparatively, being set on a dark back-ground. The irridation of such lights is not circular, nor uniform. Different eyes give different patterns. To himself the rays always seemed like the spokes of a wheel,—two larger than the other being upward, or rather nearly vertical to a line drawn from angle to angle of the eye, for these largest spokes turn with the head. If we close the right eye, the irridating figure is changed; if we close the left eye it is again changed. Some eyes always see different figures from others; perhaps to no two are they exactly alike.

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TO CORRESPONDENTS.

M. K., of Ind.—There are three engravings of Lime Kilns on page 61, Vol. 5, Sci. Am., and one figure on page 93, same volume; the latter shows how to burn lime in the field, and is exactly the kind of information you want.

T. P., of Maine.—We do not know of a single good roof cement, in which some linseed oil is not used. Sawed shingles absorb more moisture than shaved ones, consequently they sooner decay by the action of evaporation. The best and cheapest coating for roofs is composed of pitch and tar in equal proportions, some linseed oil, and ground brick-dust mixed along with them.

H. S., of Ky.—Your plan of a pen appears to be the same as that of the fountain pen. It simply retains more ink than the common pen. We think a patent could not be obtained.

G. W. S., of N. J.—Your float for steam boilers does not, in our opinion, possess any patentable feature;—the difference between it and others is not sufficient to warrant an application for a patent.

C. A. M., of Ohio—Your suggestions in regard to a municipal fire telegraph are no doubt excellent, but they lack novelty; on page 219, Vol. 7, of the Sci. Am., you will find the subject fully presented.

A. C. E., of Me.—The subject of "Water Cure," which you propose to discuss in our columns, is certainly one of interest, but we are not disposed to open our columns to it: it is a field which belongs to others, and is especially and extremely well managed by Messrs. Fowlers & Wells, of this city, to whom we advise you to address your ideas.

Y. E., of Geo.—You can avail yourself of our columns for the purpose of publishing your invention;—it is probably the best means you can adopt for spreading a knowledge of it to the community.

R. F., of Conn.—Your view is a very sensible one, but many times the hose is run down a considerable distance from the hydrant, before it is laid across the track.

H. S. T., of Vt.—Use the common kind of paddle wheel.

E. H., of Mass.—A coarse cheap paint can be made by using fine hydraulic cement dust, mixed with oil to which, add one pound of good white lead for every twenty of the cement.

H. C. W., of Pa.—Your explanation makes the matter clear. We have, however, the accounts of many explosions when the steam was blowing off, which seem to be the very opposite of your opinion. We have seen such evidence taken on trials held on the causes of explosions.

J. G. S., of Pa.—Your plan of providing tomb stones is very good, but would it not be better to make the whole of cast-iron and paint on the letters; it strikes us that this would be the best plan. The plan of a glass case in an iron frame containing the epitaph or portrait of the deceased, is the same as that seen on many of the tombstones in our graveyards. A patent, we believe, could not be obtained.

R. A., of Conn.—We cannot become a medium for the ventilation of such ideas as you make upon the subject of "Caloric Engines," we know them to be wholly at varlance with true science, and we have successfully refuted the same arguments. It is useless to discuss the subject again, all of our readers are well informed in regard to it, and they want something new or nothing.

Money received on account of Patent Office business for the week ending Saturday, May 20:—

J. I., of Ohio. $30; J. P., of L. I., $25: J. C. R., of N. Y., $275; W. B. B., of N. Y., $25; T. E. R., of N. Y., $25; G. C., of Me., $10; J. D. W., of N. Y., $30; J. & C., of Ind., $30: T. H. D., of N. H., $35; T. G. B., of Ct., $30: C. A. R., of Iowa, $75; A. D., of L. I., $30: L. & S., of O., $30: S. G., Jr., of N. Y., $30; G. M. B., of O., O., $30; C. P. P. of N. Y., $275; D. C. M., of N. Y., $30; H. & C., of N. Y., $30; J. W. M., of Ill., $25; T. P., of N. Y., $150; C. T. S. W., of N. H., $40; J. L. R., of Mass., $25; A. J. G., of—— $62; J. B., of Pa., $30; H. M., of N. Y., $10; E. W. D., of Ct., $30; J. S, Van G., of Tenn., $10; F. & W., of L. I., $10; S. J. & C. H. T., of Mass., $55; J. C, of Ind., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, May 20:—

W. H. B; of N. Y.; H. & S. H. P., of Pa; J. P., of L. I.; J. H., of N. Y.; T. H. D., of N. H.; F. & W., of L. I.; C., P. S W., of N. H.; J. W. M., of Ill.; T. E. R., of N. Y.; J. S. Van G., of Tenn.; S. J. & C. H. T., of Mass.; J. L. R. of Mass.

A Chapter of Suggestions, &c

PATENT LAWS—The seventh edition of the American Patent Laws and Guide to the Patent Office, published by us, having been exhausted, we shall not be able to furnish orders under ten days or two weeks, Those who have remitted money for copies will be supplied immediately on the issuing of a new edition.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

PATENTEES—Remember we are always willing to execute and publish engravings of your inventions, providing they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engravings executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post-office also omitted Persons should be careful to write their names plainly when they address publishers, and to name the post-office at which they wish to receive their paper, and the State in which the post-office is located.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement: Of Vols. 1, 2, 3, and 4—none. Of Vol. 5, all but six numbers, price, in sheets, $1; bound, $1,75. Of Vol. 6, all; price in sheets, $2; bound, $2,75. Of Vol. 7, all; price, in sheets, $2; bound, $2,75. Of Vol 8, none complete, but about 30 numbers in sheets which will be sold at 50 cents per set; of Vol. 9, none previous to Jan. 1st, 1854.

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NORTH AMERICAN ROCK DRILLING CO.—Now offer for sale the best Rock Drilling Machine in use. Said machines, with one man and two horses, will do the drilling of twenty men. Address their agent HENRY GOULDING, 37 3* 14 Andover st, Boston Mass.

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WANTED—By a machinist, a situation to go West or South; has a general knowledge of the trade, is capable of making mechanical drawings, &c.; has been engaged of late years in the construction of several patented machines. Can give undeniable testimony of mechanical ability. Is a young man with small family;—would prefer a country town. Address A. M. S., box 125, Elizabethtown, N. J. 1*

LATHES AND PLANERS—Of much approved construction, manufactured and kept constantly on hand, by LEONARD & CLARK Newburgh, Orange Co., N. Y. 37 4*

TO TINMEN—And Workers in other Plate Metals. For Sale—One of the New York Style of Rotary Presses, which cuts out the blanks and turns up the edge at the same operation. This Press works with great rapidity, and has been timed at the rate of 60,000 per ten hours—geared to work by hand or with power. Sold only because the owners have enough other presses for their work, and for no defect. There are several dies made to fit the press. Price will be made low. Inquire or address No. 78 North front st., Philadelphia. 37 3*

ANASTATIC PRINTING—On a new Principle.—Persons desirous of learning the art of reproducing perfect impressions (equal to the original) from old prints can get full instruction by addressing A. G. S., care of Charles Fisher, 196 Mott st. (rear building), N. Y. Post-paid letters, inclosing $20, will find prompt reply. 37 3*

WOODWORTH'S PATENT Planing, Tonguing, Grooving Machines.—Double machines plane both sides, tongue, and groove at one and the same time, saving one half of the time when lumber is required to be planed both on sides. Large assortment constantly on hand. Warranted to give entire satisfaction to purchasers. JOHN H. LESTER, 37 13* 57 Pearl st, Brooklyn, L. I.

FOR SALE—A valuable India Rubber Patent Right. For further information address FRANCIS D. HAYWARD, 36 4* Malden, Mass.

AUCTION SALE—The Percussion Cap Machinery and Fixtures of Phipps & Titcomb, will be sold at Water Cure Hall, Three River Village, Palmer, Mass., June 7th, 1854. Any information respecting the machinery may be had by addressing PHIPPS & TITCOMB. 36 2*

PROPOSALS will be received at the Engineer's Office, Huntington, Pa., until Monday, June 5, for the Superstructure of Bridges and Trestle Work of the Huntingdon and Broad Top Railroad. Plans and specifications will be exhibited at the Office, or the contractor may furnish his own plan with his bid. S. W. MIFFLIN, C. Eng. 36 3

NORCROSS' ROTARY PLANING MACHINE. The Supreme Court of the U. S, at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks, is not an infringement of the Woodworth Patent. Rights to use N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS, 208 Broadway, New York. The printed Report of the case with the opinion of the Court can be had of Mr. Norcross. 36 tf

TO CANDY MANUFACTURERS—For sale or rent a beautiful three story brick dwelling and store house, together with a two story brick shop, used for the manufacture of candies. The whole is well built and finished, and the shop has furnaces all in working order. The store room is handsomely furnished with glass casing, shelving, counters, and two superb bow windows, and handsome gas light fixtures. Possession of the store room, cellar, and shop can be had immediately. Terms reasonable; price $5000; rent $300, or for store room, cellar and shop, $200. Address, post paid, A. F. WARD, York, Pa. 35 4*

FOR SALE—By the Baltimore and Ohio Railroad Co., 24 Crate Cars, adapted to railroad purposes, which will be sold at a reasonable price. For further information apply to SAMUEL J. HAYES, M. of M., Baltimore and Ohio R. R. Co., or BRIDGES & BRO., 48 Fulton st., New York. 34 tf.

GRIFFITH'S PATENT VALVE COCKS for Steam Engines, dyeing establishments, or Chemical Works, They are warranted superior to any valve or cock in use. They are easily repaired without taking them from the pipes, they are made any size from 3-8 in. up to 7 1-2 in., either screwed or with flanges. Responsible agents for the sale of these valves wanted in New York. Boston, Pittsburg, and all the principal cities in the Union. The rights to manufacture in the different States for sale. Parties interested will address J. GRIFFITHS, City Tube Works and Brass Foundry, 15 North 7th street Philadelphia. 34 8*

FULTON FOUNDRY AND MACHINE WORKS S. W. corner of Green and Morgan streets, Jersey City, N. J. The subscribers are prepared to contract for Sugar Mills and Mining Machinery of every description. Horizontal Steam Engines of various sizes constantly on hand. All orders executed with promptness. FIELDS, BROTHER & CO. 34 13*

ENGINEERING—The undersigned is prepared to furnish plans for ever description of machinery, water wheels, turbines, and to consult with parties to make experiments and scientific investigations, and to superintend the construction of works. Agent for Mellier's Patent for making White Paper from Straw. VICTOR BEAUMONT, 33 10* Consulting Engineer, 74 Broadway, N. Y.

UNITED STATES PATENT OFFICE, Washington, May 16, 1854.

ON THE PETITION of Richard Montgomery and Lewis W. Harris, of Sangerfield, New York, praying for the extension of a patent granted to them for an improvement in the Mill for Breaking and Grinding Bark, for seven years from the expiration of said patent, which takes place on the 12th day of August, 1854,

It is ordered that the said petition be heard at the Patent Office on Monday, the 24th of July next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing. All testimony filed by either party, to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 14th of July; depositions and other papers relied upon as testimony, must be filed in the office on or before the morning of that day; the argument, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York; Post, Boston, Massachusetts, and Inquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the 24th day of July next, the day of hearing. CHARLES MASON, Commissioner of Patents.

P. S—Editors of the above papers will please copy, and send their bills to the Patent Office, with a paper containing this notice. 37 3

UNITED STATES PATENT OFFICE. Washington, April 18 1854.

ON THE PETITION of Charles Spafford, administrator of George Spafford, late of Windham, Connecticut, praying for the extension of a patent granted to him on the 2nd day of September, 1840, for an improvement in "machines for boiling and washing rags for manufacturing paper," for seven years from the expiration of said patent, which takes place on the 2nd day of September, eighteen hundred and fifty-four,

It is ordered that the said petition be heard at the Patent Office on Monday, the 13th of August next, at 12 o'clock. M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 3d of August: depositions, and other papers relied upon as testimony, must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Evening Argus, Philadelphia, Pa.; Scientific American, New York; Daily Courier, Buffalo, N. Y., and Post, Boston, Massachusetts once a week for three successive weeks previous to the 13th day of Aug. next, the day of hearing. S. T. SHUGERT, Acting Commissioner of Patents

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 36 3

1854—MICHIGAN CENTRAL R R. LINE,—D. W. WHITING, Freight Agent for Railroad and the enormous new steamers "Plymouth Rock," "Western World," and "May Flower,"—and also General Forwarder, will forward freight of any kind, by any mode of conveyance, to any destination, with dispatch and at the lowest rates; has trucks and machinery and (having been a practical machinist has all the skill necessary) for the safe and expeditious handling of any machine or heavy article, such as Locomotives, Steam Engines and Boilers, Engine Lathes, Church Bells, Safes, &c. Mark packages care "D. W. Whiting, Buffalo;" goods thus consigned take precedence with the above boats in all cases. 32tf

STAVE AND BARREL MACHINERY—HUTCHINSON'S PATENT.—This machinery, which received the highest award at the Crystal Palace, may be seen there in operation during the ensuing season. Cutting, Jointing and Crozing Staves and Turning Heads. Staves prepared by this process are worth to the cooper from 20 to 40 per cent more than when finished in another way. Applicable alike to thick and thin staves. Apply to C. B. HUTCHINSON & CO., Auburn, N. Y, or at the Crystal Palace. 34tf

KRUPP'S BEST CAST STEEL—Suitable for Mint and Plater's Rollers, also of large size (72x18 inches diam) for rolling iron, copper or brass. Pistons of Steam Engines, and Shafts for Steamboats, not exceeding six tuns weight in one piece. Also the celebrated Cast Steel Axles and Tire, made from a solid bar without welding. Agents, THOS. PROSSER & SON, 33tf 28 Platt st, New York.

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MODELS—Of all kinds made and warranted to answer the requisitions of the Patent Office. Post-paid communications strictly confidential. Address J. G. ARNOLD, Worcester, Mass. 31 10*

PORTABLE FORGES AND BELLOWS—(Queen's patent). The best forge in market for Blacksmiths work, Boiler Makers, Mining, Quarrying, Shipping, plantations, Contractors on Railroads and Public Works, Coppersmiths, Gas Fitters, &c., Also an improved Portable Melting Furnace for Jewellers, Dentists, Chemists, &c., both of which are constructed with sliding doors to protect the fire from wind and rain when used outdoors, and for perfect safety and free escape of smoke when used indoors. They are compact for Shipping. Circulars with particlars and prices will be forwarded upon application. Cast iron Columns, for building constantly on hand. Jobbing, Piano, and all kind of work promply executed. FREDERICK P. FLAGLER, 29 10* Sole Manufacturer, 210 Water street, N. Y.

MINING MACHINERY—Of most approved construction, furnished by FRED'K COOK & CO, Hudson Machine Works, Hudson, N. Y. 15 6m

STAVE MACHINERY.—The "Mowry Stave Cutter and Jointer Combined," which received the highest award at the Crystal Palace, is the only machine that ever undertook to joint a stave properly at the same time that it was cut and dressed, without rehandling. One man tends the machine and turns out from a solid block of wood ninety staves a minute, ready for the truss hoop. It is not only the best in use, but for slack work we challenge the world. For machines and rights in New York, apply to CHARLES MOWRY, Auburn. For machines and rights in other parts of the United States, apply to GWYNNES & SHEFFIELD, Urbana, Ohio. 29 tf

CIRCULAR SAW MILLS—The undersigned are manufacturing, and keep constantly on hand.—"Child's Premium Double and Single Circular Sawing Machines." The best machine in use for sawing lumber from logs of all sizes, and warranted capable of cutting more lumber in a given time than any other mill. H. WELLS & Co., 31 8 eow* Florence, Hampshire Co., Mass.

PIG IRON—The subscriber has always on hand a stock of the best brands of American and Scotch Pig Iron, for sale at the lowest market price. G. O. ROBERTSON, 135 Water st, cor. Pine, N. Y. 13 14eow*

NEW HAVEN MANUFACTURING COMPANY—New Haven, Conn., (successors to Scranton & Parshley) have on hand Power Planers, to plane from 3 to 12 feet; slide lathes from 6 to 18 feet long; 3 sizes of hand lathes, with and without shears; and counter shafts: universal chucks; drill presses, index plates, bolt cutters, and slide rests. The N. H. M. Company also have the right for Harrison's patent Flour and Grist Mill for the term of five years, and are prepared to furnish these superior mills at short notice. They are unequalled by any other mill, and will grind from 20 to 30 bushels per hour, and will run without heating, being self-cooling. They weigh about 1400 lbs., are of the best French burr stone, 30 inches in diameter; are snugly packed in a cast-iron frame, price of mill $200, packing $5. For cuts, prices, and further particulars apply post-paid, as above, or to S. C. HILLS, agent N. H. M. Co., 12 Platt st.. N. Y. 35tf

PORTABLE STEAM ENGINES—GEORGE VAIL & CO., Speedwell Iron Works, Morristown, N. J., LOGAN VAIL & CO., No. 9 Gold st, N. Y., are prepared to furnish Portable Steam Engines from four to eight horse power, with locomotive boilers. These engines are recommended for their simplicity, durability, and economy, being made from the best materials and designed for practical use. They are placed on wheels convenient to be moved from place to place, and are shipped in working order: for plantation use, machinists, or others wanting small power, these engines will be found superior to any others in use. A Silver Medal was awarded at the late Fair of the American Institute, and a premium in cash of $100 at the Maryland State Fair, held at Baltimore in October last. Persons writing us by mail will be particular to give their address in full. 21 38*

JOHN PARSHLEY, No. 5 and 7 Howard st., New Haven, Ct., manufacturer of Machinists' Tools, and Steam Engines, has now finishing off 25 Engine Lathes, 6 feet shears, 4 feet between centers, 15 inches swing, and weighs about 1100 lbs These Lathes have back and screw gear, jib rest, with screw feed, and the rest is so arranged that the tool can be adjusted to any point the work may require, without unfastening the tool, hence they possess all the good qualities of the jib and the weight lathe; they are of the best workmanship. Price of Lathe with count shaft and pulleys, $155 cash. Cuts, with full description of the lathe, can be had by addressing as above, post-paid. Also four 30 horse power vertical Steam Engines with two cylinders. Price of engine with pump and heater, $800 cash. For particulars address as above. 35tf

$100 REWARD—To the Manufacturers of Bank Note Paper. The Executive Committee of the Association of Banks for the Suppression of Counterfeiting, hereby offer a reward of One Hundred Dollars for the best specimen, in the opinion of the Committee, of Bank Note Paper, of not less than five hundred sheets, which may be submitted to them on or before the 1st day of January next. All paper submitted, except that selected by the Committee, to be returned to the persons submitting the same. J. M. GORDON, Secretary Boston, Mass., March 31, 1854. 31 15*

SCREW CUTTING MACHINES, with P. W. Gates' Patent Dies—The subscribers keep constantly on hand three sizes of the above-named machines, to wit—No. 1 machine, 10 sets dies and taps from one-half to two inches, $350: No. 2, 8 sets dies and taps, one-half to one and a half inches, $250; No. 3, 6 sets dies and taps, three-eighths to one inch, $150. Cash on delivery at shop. P. W. GATES & CO. Chicago, Ill. 27 15*

HUDSON MACHINE WORKS and Iron Foundry—at Hudson City, N. Y., are prepared to contract for castings for railroads, bridges, buildings, gas pipes and posts, water pipe, cast-iron ornamental floors, cannon, &c. Steam engines and boilers, high and low pressure, sugar mills, Cornish lifting and forcing pumps for mines; stamps, mortars, and mining machinery;—also superior hydraulic pumps and presses, and superior machinists' tools made to order. Especial attention given to the making of patent machines. Orders by mail will receive prompt attention. New York Office No. 18 Exchange Place. FREDERIC COOK & CO. F. COOK, H. McCLELLAND. 27tf

MACHINERY FOR SALE—The following machines are for sale at the "Scientific American" Office:—Alcott's Concentric Lathe, price $25.
Portable Mortising Machine, $20
Bushnell's Iron Drill, $25
All orders should be addressed (accompanied with the cash) to MUNN & CO., 128 Fulton st., N. Y.

WHITE STRAW PAPER—For Newspapers.—A Mellier, the patentee, having established his process at Nixon & Xeinour's Mills, Manayunk, where the paper for the Philadelphia Ledger has been made daily from straw since the 12th of April, is now ready to sell licenses and make arrangements for establishing the process elsewhere. Apply to A. MELLIER & Y. BEAUMONT, 74 Broadway, where specimens of half stuff, stuff and paper may be seen. 33 10*

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic, Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc., etc. CHARLES W. COPELAND, 35 tf Consulting Engineer, 64 Broadway.

PLANING, TONGUING, AND GROOVING—BEARDSLEE'S PATENT.—Practical operation of these Machines throughout every portion of the United States, in working all kinds of wood, has proved them to be superior to any and all others. The work they produce cannot be equalled by the hand plane. They work from 100 to 200 feet, lineal measure, per minute. One machine has planed over twenty millions of feet during the last two years, another more than twelve millions of of feet Spruce flooring in ten months. Working models can be seen at the Crystal Palace, where further information can be obtained, or of the patentee at Albany, N. Y 27tf GEO. W. BEARDSLEE.

STATIONARY STEAM ENGINES—The subscriber is now prepared to furnish, with or without pumps, boilers, &c., Horizontal Engines on iron bed frames, good strong, substantial, plain finished engines that will do good service, say from 4 horse, $215, to 30 horse, $1,037: they have Judson's patent valves, and will be warranted to work well. S. C. HILLS, 31tf 12 Platt st, New York.

A. B. ELY, Counsellor at Law, 52 Washington street, Boston, will give particular attention to Patent Cases. Refers to Messrs Munn & Co., Scientific American. 16 1y*

SEWING MACHINE—The Office and Warerooms of the Wheeler & Wilson Manufacturing Company, for the sale of their Sewing Machines, is removed to No. 343 Broadway, where the public are invited to call and examine them in practical operation. 31 13*

BAKER'S IMPROVED BOILER FURNACE—As used at the Crystal Palace: orders received for Stationary, Marine, or Locomotive Furnaces on this plan, and also for the rights for towns, counties, or States: certificates can be shown of furnaces in use for stationary, marine, and locomotive furnaces, with saving from 30 to 50 per cent. in fuel. J. AMORY, 25tf General Agent. 28 State st, Boston, Mass

NORRIS WORKS, Norristown, Pa. The subscribers build and send to any part of the United States, Pumping, Hoisting, Stamping and Portable Engines, and Mining Machinery of every description. 41 1y.* THOMAS, CORSON & WEST.

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Scientific Museum.

Varnishes.

Spirit and turpentine varnishes are prepared by mixing the resins and the solvent together, and agitating the whole with a stick having a number of pegs or nails driven in near the lower end until the solution is complete. The resins should be dry, and in small pieces, with the impurities picked out; the finest and clearest pieces of the gum are set aside for superior varnishes. Turpentine varnishes are made in quantities of 10 or 12 gallons; spirit varnishes from 4 to 8 gallons. In making the latter, the ingredients are sometimes put into a cask of 8 or 16 gallon's capacity, and mounted so as to revolve upon bearings at the ends. An alternating motion is given to the barrel by passing round it a cord terminating in a cross handle. When the operator pulls this cord towards him the barrel rotates and winds the cord up in the other direction so as to be ready for a second pull, which, in like manner, winds the cord in the opposite direction, and so on. Agitation must be kept up, or the resin will agglutinate. After 3 or 4 hours, or when the solution is complete, the varnish is left for a few hours to deposit solid impurities, and is then strained through muslin or lawn into bottles. Coarsely pounded glass is sometimes added to prevent the agglutination of the resin. When heat is employed in making spirit varnishes, the source of heat should be a water or a sand bath, and a still and worm may be used to prevent loss by evaporation, the resins and solvent in the still being kept in motion by a stirrer passing through a stuffing box in the head. Shellac contains a little wax, which is apt to get diffused through the varnish when heat is applied. The inflammable nature of the ingredients will of course suggest the necessity for caution in making spirit varnishes. The utensils employed must be quite clean and dry.

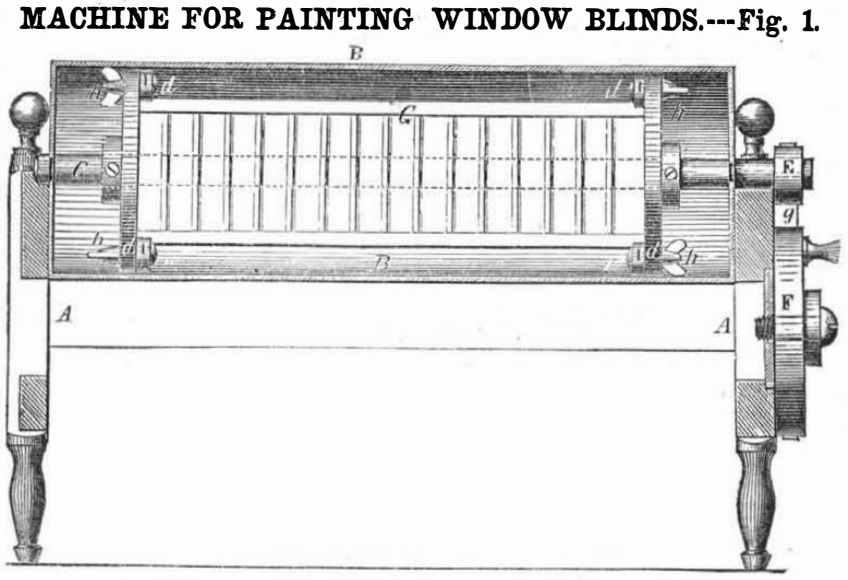
Best white hard spirit varnish, such as will bear polishing, is made by adding 2 lbs. of the best picked gum-sandarach to 1 gallon of alcohol and agitating for 4 hours, until the solution is complete. 18 ozs. of Venice-turpentine, (or 9 ozs. if the work is not to be polished,) are to be moderately heated in a water-bath until quite fluid, and added to the varnish to give it body. Agitate for an hour, strain and put into bottles, which must be kept well corked. After remaining undisturbed for a week the varnish is fit for use. If the clearest and palest pieces of gum be selected, this varnish will be pale enough for white work.

WHITE HARD VARNISH.—(No. 1.) 3½ lbs. of gum sandarach to 1 gallon of spirits of wine, and when the solution is complete add 1 pint of pale turpentine-varnish, and shake the whole well together. (No. 2.) 2 lbs. of gum sandarach, 1 lb: of gum mastic, and 1 gallon of alcohol. White spirit varnish for violins.—2 lbs. of mastic to 1 gallon of spirits of wine and 1 pint of turpentine-varnish.

Brown hard spirit varnish is similar to white hard varnish, only shell-lac is used instead of sandarach. Dissolve 2 lbs. of shell-lac in 1 gallon of spirits of wine, and then add 18 ozs. of Venice turpentine, warmed. This varnish will bear polishing. Or, 2 lbs. of shell-lac, 1 lb of sandarach, and 2 ozs. of mastic dissolved in 1 gallon of spirits of wine. A lighter color is produced with 2 lbs. of sandarach, 1 lb. of shell-lac, and 1 gallon of spirit. When the solution is complete add a pint of turpentine varnish, and agitate the whole well together. If a pale lac varnish be required, white or bleached lac may be used. "Dissolve 5 ozs. of shell-lac in a quart of rectified spirits of wine; boil for a few minutes with 10 ozs. of well-burnt and recently heated animal charcoal, when a small quantity of the solution should be drawn off and filtered; if not colorless, a little more charcoal must be added. When all color is removed, press the liquor through silk, as linen absorbs more varnish, and afterwards filter it through fine blotting-paper."

Dr. Hare has published a method of bleaching lac:—"Dissolve in an iron kettle 1 part of pearlash in about 8 parts of water, add one part of shell or seed-lac, and heat the whole to ebullition. When the lac is dissolved, cool the solution and impregnate it with chlorine gas till the lac is all precipitated. The precipitate is white, but the color deepens by washing and consolidation; dissolved in alcohol, lac bleached by this process yields a varnish which is as free from color as any copal varnish." The application of the chlorine must be made by a person acquainted with chemistry. Hence chloride of lime is safer as a bleaching agent, the lime being afterwards dissolved out from the precipitate by the addition of muriatic acid. The precipitate is to be washed several times, dried and dissolved in alcohol with the addition of a little mastic. This varnish is very pale, and rather thin.

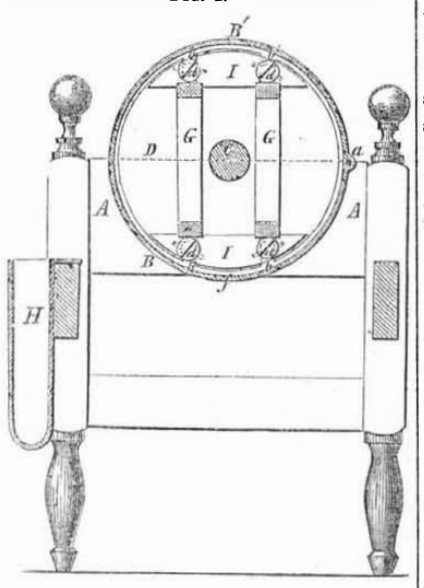
MACHINE FOR PAINTING WINDOW BLINDS.---Fig. 1.



The annexed engravings are views of a machine for painting window blinds, for which a patent was granted to Samuel T. Field, of Worcester, Mass., on the 18th of last month, (April 1854.) Figure 1 is a longitudinal vertical section of the machine, and figure 2 is a transverse section of it. The same letters refer to like parts.

This invention consists in a hollow stationary cylinder box, or casing, provided inside with suitable means, by which the blinds, sashes, or other articles to be painted, may be held securely and revolved. The articles are first dipped into a trough containing a sufficient quantity of paint, and are then secured within the cylinder, and a very rapid revolution given to them. The effect of said revolution is to throw off by centrifugal force all the superfluous paint, and leave a proper quantity evenly distributed over the whole surface of the articles. The paint thrown off is received on the inner surface of the cylinder, box, or casing, and running to the bottom of it passes through an opening provided for the purpose into a suitable receptacle placed below, from which receptacle it can be again returned to the painting trough.

FIG. 2.



A is the frame of the machine; B B' is the cylinder or case which is of metal or other material, and may be of suitable length and diameter, to contain any number of blinds, and to allow them to revolve within it; it is placed in a horizontal position on the frame, and is constructed in two parts, the lower, B, which is secured firmly to the frame, and the upper, B', which is attached to the lower by a hinge or hinges, *a*, so that it forms a lid which can be opened. At the bottom of the cylinder is the opening, *f*, through which the paint runs out; C is a shaft which passes through the center of the cylinder, being provided with journals working in suitable bearings either in the ends of the cylinder, or upon the frame; it has two circular disks or ends, D D, one or both of which should be adjustable lengthwise on the shaft, but both intended to be firmly secured to the shaft. The two disks have each four slots, *b b*, *b' b'*, two on each side on opposite sides of the shaft, *b b*, being opposite to each other and in line, and *b' b'*, being similar to and parallel with them; I I are clamps, of which there are two to each disk, consisting of plates of metal, or pieces of wood of segmental form, each provided with two holes of the same distance apart as the slats, *b b'*, in the disks; through these holes and through the slots, pass screw bolts, *d d*, which are provided with nuts, *h h*, by which the clamps can be secured firmly to the disks; the slots allow of the clamps being moved nearer to, or further from the center of the disks. There are notches in the inner edges of the clamps, in which the stiles of the blinds sit; G G are a pair of blinds placed between the clamps.

The shaft, C, is furnished at one end and outside the cylinder, with a small pulley, E, round which runs the band, *g*, leading from a large driving pulley, F, which is for the purpose of giving it a rapid rotary motion. In front of the frame is placed the trough, H, containing the paint or materials in which the blinds are dipped.

The operation of the machine is conducted as follows:—The lid is opened and the disks are adjusted upon their shaft at the proper distance apart, to receive the blinds endwise between them. One of the clamps, I, of each disk is then loosened or removed from the disk, the other being left fixed; the fixed ones are turned downwards, care being taken that the clamps on each disk are opposite those of the other one. The blinds having been dipped in the trough, H, are taken out, and then placed one on each side of the shaft, with one stile resting in one set of notches, *e e*, of the clamps. The loose clamps are then tightened upon them, and the lid of the cylinder being closed, rotary motion is given to the driving pulley which communicates it to the shaft, C, and disks, D D, causing the blinds to be whirled rapidly within the cylinder. This is to be continued for about five minutes, and all the superfluous paint is thrown off to the inner periphery of the cylinder, leaving the proper quantity upon the blind. The machine may then be stopped, the lid opened, and the blinds taken out, when they only require to be touched up by the brush at the parts where the clamps have been in contact with them.

Sashes or any article of similar form and construction may be secured between the disks in the same manner as blinds, but some other articles might require a different means of holding them. The clamps may be increased in size or number, so as to take a larger number of articles if thought desirable.

The advantage to be derived from the use of this machine is the quantity of work it will perform—an unskilled laborer being able to do as much work as several painters, and in quite as perfect a manner. The invention is not only applicable to painting, but may be used for covering or coating articles with any material.

The inventor states that he can paint 100 pairs of blinds in one day with this machine, when driven by power, and 75 pairs when driven by hand.

More information may be obtained about it by letter addressed to the inventor at Worcester, Mass.

LITERARY NOTICES.

A NEW UNIVERSAL ATLAS—Containing maps of the various Empires, Kingdoms, States, and Republics of the World, with a special map of each of the United States, plans of cities, &c. Cowperthwait, Desilver & Co., Philadelphia. For sale by John Wiley, 167 Broadway, New York City. Price, plain bound, $12; half Russia and half calf, extra, $13. We have come across no work, latterly, with which we have taken so great pleasure and derived so much profit in perusing, as the "New Universal Atlas," by that celebrated geographer—Mitchell. The Maps have been prepared with the greatest accuracy, and they are so comprehensive and beautifully executed that it seems as if every family in the United States would desire a copy, if they were acquainted with its merits. This Atlas has been prepared apparently with the greatest care without regard to expense; the several States of the Union, occupying full pages, are divided off into counties, and all the principal cities and towns are distinctly set down, and their locations are correctly given, so far as we have been able to discover, and we have examined them with critical care. This Atlas has also elaborate maps of Russia and Turkey, showing the disputed territory that is of so much interest at the present time. A table, giving the population of the different countries and principal cities of both hemispheres, is contained in this Atlas, and the fact shown in one instance is one probably, not generally known, i. e., that the population of Russia increases every year over one million of inhabitants. At some future time we shall probably present some interesting facts culled from the pages of the "New Universal Atlas"—showing the present condition of the world, geographically from what it was in our school-boy days when Mitchell's primary Atlas was our companion.

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